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PROCEEDINGS

OF THE

CALIFORNIA

Pharmaceutical Society

AND

COLLEGE OF PHARMACY;

16940

FOR THE YEARS 1883 AND 1884.

ALSO

Proceedings of the Alumni Association.

SAN FRANCISCO:
BACON & COMPANY, PRINTERS,
508 CLAY STREET
1885.

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OF THE

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AND

COLLEGE OF PHARMACY.

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GRAZER. RUNYON. WENZELL.

AUDITING.

ROSSI. SCHMIDT.

NEW MEMBERS.

RUNYON. DAWSON. GRAZER.

BUILDING FUND.

RUNYON. KEIL.

PUBLICATIONS.

SEARBY. RUNYON.

EXAMINATIONS.

BOARD OF TRUSTEES.

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President of the University of California.

WM. T. WENZELL, M. D. - - - PROFESSOR OF CHEMISTRY.
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E. W. RUNYON, PH. G. - - - - PROFESSOR OF PHARMACY.
E. W. RUNYON, PH. G. - - - DEAN OF THE FACULTY,
529 Market Street.

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F. LENGFELD, PH. G. - - - - CHEMISTRY.
F. A. BECKETT, PH. G. - - - - - PHARMACY.
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J. J. B. ARGENTI, PH. G. - - - - BOTANY.
A. A. D'ANCONA, A. B., M. D. - - INSTRUCTOR IN LATIN.

PREFATORY.

THE following pages contain a condensed report of the proceedings of the California Pharmaceutical Society and College of Pharmacy for the years 1883 and 1884. Several causes combined last year to prevent the usual publication from appearing at the proper time; so it was deemed best to wait until the proceedings of two years could be issued together. While it will be felt that a few of the articles have lost some of their freshness by the delay, it will yet be seen that thoughtful, painstaking work is being done by some of our members all the time, and that their work deserves to be known far beyond the limited circle that is privileged to attend the various meetings here recorded. It is hoped that a perusal of the PAPERS will stimulate other pharmacists to make similar contributions, whether of a strictly practical or more abstract, scientific character.

As the COLLEGE enlarges its plans for more effective teaching from year to year, it makes an increased draft upon the services of our city members. A reference to the THIRTEENTH LECTURE ANNOUNCEMENT, just issued, will show that the entire Board of Trustees and several of the more active of the Alumni will be called upon during the Lecture Session of 1885 to devote some of their time to the work of instructing the younger members of our profession, by assisting the Faculty in the Preliminary, Periodical, and Final Examinations, and in the Quiz Classes. The work thus done will not impress outsiders as forcibly as would original investigations calling for the same sacrifice of time and effort. Yet it will doubtless inure to the advancement of Pharmacy on this Coast, being prompted by that principle in political economy which seeks to do the greatest good to the greatest number. Will not our country pharmacists bear in mind the contribution thus levied upon their city *confreres*, and endeavor to do their part by preparing papers, or in some way adding to the stock of pharmaceutical knowledge?

The proceedings of the ALUMNI ASSOCIATION are here published for the first time. They will be found well worthy of perusal. To those who have been closely connected with the College from its establishment, it is a great satisfaction to find the Alumni doing earnest work in their profession, and giving promise of better things to come as riper years bring a richer experience, and increased leisure gives better opportunities.

EDITOR.

SAN FRANCISCO, March, 1885.

ANNUAL MEETING.

The Fifteenth Annual Meeting of the Society was held at the College Hall on the evening of January 17th, 1884, President Keil in the chair.

After the usual business, the following new members were elected, the Secretary being instructed to cast the ballot—Dr. Hutchinson, C. R. Fitzell, F. A. Beckett.

The nominations for officers to serve for the ensuing year being next in order, Mr. Calvert nominated James Topley, of Vallejo, for President, and referred to the earnest labors of that gentleman in behalf of the Society.

Mr. Searby heartily endorsed the nomination, and followed with a few remarks.

Mr. Topley declined the honor, but was finally prevailed upon to accept.

A list of the officers elected will be found on the first page.

Reports of the outgoing officers were next read.

President Keil in his report referred to the prosperous condition of the Society, and called upon the members to help to mitigate the evils arising from the manufacture of elegant pharmaceutical preparations. He recommended an occasional exhibit of pharmaceutical preparations, which would certainly compare with any made outside of a pharmacy.

The report was accepted.

Professor Searby, referring to Mr. Keil's suggestion of having an exhibition, remarked that he thought considerable ability would be displayed by some of the pharmacists on this coast.

Treasurer Schreck read his annual report, which was adopted, and referred to the Auditing Committee.

Professor Searby, Acting Secretary of the Board of Trustees, was next called upon for his report. He read the minutes of the last meeting, which were approved, followed by his report as Secretary.

Mr. Schreck moved to have the report accepted, and to extend a vote of thanks to the outgoing Board; seconded, and carried.

Secretary Grazer's report was read and accepted; also his report as Librarian and Curator.

Mr. Keil, in speaking about the condition of the Library, considered it desirable for the members to take an active part in having the Library enlarged by donations of books.

Mr. Schreck moved to open a Library fund.

Professor Searby related that Mr. Thompson had recommended him as one of the Committee on non-official formulas, but not having the requisite time to devote to this duty, he called upon the members to appoint some one to act in his place.

Mr. Dawson was unanimously recommended.

The meeting adjourned at 11:20 P. M.

SECRETARY'S REPORT.

To the Officers and Members of the California Pharmaceutical Society and College of Pharmacy,

GENTLEMEN:

During the year 1883, six meetings were held—four regular quarterly, an adjourned annual meeting, and one special meeting. Owing to the unsettled condition of affairs in the beginning of the year, inasmuch as we were unable to secure the use of the Academy of Sciences for the meetings of the Society and College Lectures, and as the present building was yet in an unfinished condition, the regular time for holding the quarterly meetings was somewhat interfered with in the beginning of the year, and necessitated such throughout the remainder. During the year sixteen

new members were added, nine resignations were accepted, four were dropped for non-payment of dues; leaving the Society with a membership of ninety. The moneys collected up to date, and paid over to the Treasurer, amount to $467.25; the last quarterly collections made include dues up to December 1st, 1883, leaving $51.50 outstanding to balance all accounts of members to said date.

Very Respectfully,

FRED. GRAZER, Secretary.

TREASURER'S REPORT.

To the Officers and Members of the California Pharmaceutical Society and College of Pharmacy,

GENTLEMEN: I herewith beg to hand you my Annual Report:

1883. PRELIMINARY STATEMENT.

Jan. 11.	To balance on hand, as per statement rendered by my predecessor, and disposed of as follows:		
	Odd Fellows' Bank, Cal. Phar. So....	$983 96	
	Redington & Co., Col. of Pharmacy...	677 98	
	Cash in hands of Treas., W. J. Bryan,	146 52	
			$1,808 46
	Realized on the above as follows:		
	Redington & Co.....	$677 98	
	Wm. J. Bryan.....	146 52	
	Odd Fellows' Bank, Dividend 10%..	98 39	
	* Proceeds of Sale of Balance of Acc't with Odd Fellows' Bank, $885.57 at 32½ cents on the dollar.....	287 81	
	Loss of settlement in this account..	597 76	
			$1,808 46

* NOTE.—The original amount of the deposit with the Odd Fellows' Bank at the time of its failure was $1,967.92, making the amount altogether realized on it very nearly 70%, which, in the opinion of bankers, is fully as much as could be expected, and what it would ultimately bring.

1883. RECEIPTS.

To Cash realized on Balance of $1,808 46 as above indicated :

Jan. 25..	To cash from W. J. Bryan.....	$146 52	
Jan. 30..	" " " Redington & Co	677 98	
	Odd Fellows' Bank Dividend.....	98 39	
Mar. 16..	" " Proceeds of Sale of Account with Odd Fellows' Bank.....	287 81	
			$1.210 70

California Pharmaceutical Society.

Mar. 16..	To cash from Secretary Grazer....	$100 00	
June 18..	" " " " "	30 50	
July 5..	" " " " "	111 50	
Oct. 19..	" " " " "	101 75	
1884.			
Jan. 8..	" " " " "	123 50	
			$ 467 25

1883. *College of Pharmacy.*

Jan. 28 to Sept. 19..	To cash—Students' Fees from Emlen Painter, Dean.....	$2,287 50	
Oct. 18..	To cash—Students' Fees from W. M. Searby.....	52 50	
Nov. 7..	To cash—Students' Fees from W. M. Searby.....	60 00	
1884.			
Jan. 16..	To cash—Diploma Fees and Certificates from W. M. Searby.....	102 00	
1883.			
Jan. 30..	To cash—Interest from Redington & Co.....	3 38	
Jan. 24 to Oct. 22..	To cash—Donations for Building Fund	3,037 50	
June 8..	To cash—Loan from Humboldt Bank at 6% int. per annum.....	2,000 00	
June 21..	To cash—Rebate from Spring Valley Water Co.....	65	
1884.			
Jan. 8..	To cash—Rent from Fred. Grazer.	8 00	
			$7,551 53
			$9,229 48

DISBURSEMENTS.

1883 *California Pharmaceutical Society.*

By Sundries	$33 13	
" Collector's Commissions	46 72	
" Secretary's Salary for 1883	50 00	
* " Publishing "Proceedings," (bal.)	35 00	
		$164 85

College of Pharmacy.

COLLEGE BUILDING.

By Cash paid W. M. Fletcher, builder,	$4,816 41	
" Percy & Hamilton, architects, for plans, etc	100 00	
By Cash paid Chemical Counter	88 00	
" Percy & Hamilton, sundries	197 40	
By Cash paid for Abstract	30 00	
" Plumbing, etc	64 68	
" Gas Fixtures, etc.	173 00	
" Carpets and Furniture	345 88	
By Cash paid for Fixtures	34 35	
" Attorney's Fees, etc	86 15	
By Cash paid for Students' Chairs	286 20	
" W. M. Fletcher, extras	49 95	
By Cash paid for Interest on Loan	81 00	
" Taxes for 1883	90 00	
		$6,443 02

COLLEGE EXPENSES.

By Cash paid for Printing	$ 16 50	
" Opening Exercises	61 10	
" Gas	73 10	
" Water	48 75	
" Advertising	49 90	
Carried Forward	$ 249 35	

* NOTE.—The total cost of publishing "Proceedings" was $279 00
But there was received for Advertisements 244 00

Balance ..... $ 35 00

Brought Forward.....	$ 249 35	
By Cash paid for Stationery.....	58 80	
" Moving.....	22 00	
" Insurance.....	57 50	
" Examination Expenses.....	63 20	
By Cash paid for Sundries	140 29	
" Commencement Ex.	207 40	
" Professors' Fees ..	1,660 00	
		$2,458 54
Jan. 17..Balance on hand.....		163 07
		$9,229 48

The receipts for the California Pharmaceutical Society for the year have been $467.25, and the expenditures $146,85.

The receipts for the College of Pharmacy have been $7,551.53, and the expenditures $8,901.56.

A portion of some of the items placed under the College Expenses belongs to the Expenses of the California Pharmaceutical Society, but it being impossible to determine the proportion, I fail to segregate it.

RECAPITULATION.

Assets.

Real Estate paid for Lot in 1882.....	$2,687 15	
College Building Cost, 1883, furnished, with the exception of the Laboratory Room.....	6,443 02	
Cash on hand	163 07	
	$9,293 24	

Liabilities.

Mortgage to Humboldt Savings and Loan Soc'y,	2,000 00	
Net Assets		$7,293 24

All of which is respectfully submitted,

E. A. SCHRECK, Treasurer.

SAN FRANCISCO, Jan. 17, 1884.

We, the Committee on Accounts, have examined the above report, and find it correct and properly vouched for.

F. C. KEIL.

J. CALVERT.

REPORT OF THE BOARD OF TRUSTEES.

To the Members of the California Pharmaceutical Society and College of Pharmacy,

GENTLEMEN:

As the proceedings of this Board have been made known to you from time to time by the reading of our minutes at each quarterly meeting, it is only necessary to report certain details of the College affairs that have not appeared in these minutes.

The great event of the year was the formal opening of the College, which took place on the 20th of April, when the lecture hall was well filled with students and friends of the institution. The addresses of President Reid, who gave a condensed history of the College, and of Rev. Robert Mackenzie, who mingled wit and wisdom, mirth and sound advice in a masterly manner, gave zest to the proceedings, and left a pleasant impression on the minds of all present.

The lecture-session, thus auspiciously opened, was marked by having the largest class we have had since the College was established. The number of matriculates was sixty-seven; of these four were medical students, two took only the Chemistry course, three failed to take out their lecture tickets, and the remainder, fifty-eight, were regular students in Pharmacy. Of these fifty-eight, thirty-four were first-course students, and twenty-four had attended one or more courses. Seven attended free, six on account of previous subscription to the capital stock, and one on account of the Junior prize.

Fifteen of the Senior Class presented themselves for examination for the degree. Of these, thirteen passed, and were recommended to the Regents of the University for the degree of Graduate in Pharmacy, and the degree was conferred by President Reid at the graduating exercises on Nov. 19th.

At the Junior Examination, thirty-three candidates presented themselves, of whom thirty-one passed.

During the year the Board have given much earnest consideration to the best means of raising the standard of qualification of the

rising generation of Pharmacists. As a step in this direction, they have determined on a preliminary examination, to be passed prior to matriculating; and they urge our members and pharmacists generally to receive as apprentices and learners only those who already possess a fair common-school education, or are willing to make up for early disadvantages by applying themselves at once and in earnest to make up these deficiencies.

W. M. SEARBY,
Secretary of the Board of Trustees.

LIBRARIAN AND CURATOR'S REPORT.

To the Officers and Members of the California Pharmaceutical Society and College of Pharmacy,

GENTLEMEN:

The condition of the Library is about the same as last year, with some slight improvements; a few new books have been added: among them two volumes of Dr. Artin's Botanic Atlas, donated by Mr. Heick, which I had bound; Professor Wenzell presented the Druggists' Circular complete. Dr. Hoffman, of New York, presented a copy of his and Dr. Powers' work, entitled "Examination of Medicinal Chemicals." Dr. C. O. Curtman, of St. Louis, presented Bertstein's Chemical Analysis, as revised by him; besides these a number of Proceedings were received from the various Pharmaceutical Societies throughout the United States. A number of Journals, such as were complete, were bound, the cost of binding being $29.16.

Very Respectfully,
FRED. GRAZER.

January 17th, 1884.

ABSTRACT OF PROCEEDINGS

— OF THE —

California Pharmaceutical Society

— AND —

COLLEGE OF PHARMACY.

PHARMACEUTICAL MEETING.

HELD MAY 10, 1883.

The regular quarterly meeting of April 13th was postponed on account of the unfinished condition of the New College Hall.

Mr. Sommer read a paper on the manufacture of Bromhydric Acid. He reviewed the various processes at present employed, and considered them somewhat costly and complicated, and not well adapted for the use of the pharmacist.

The first step in his method of making the acid was to form Zinc Bromide by the direct action of Bromine on Zinc; the Bromide of Zinc thus formed being acted upon by Sulphuric Acid in a retort, and subject to distillation. The distilled Hydrobromic Acid is collected in a well cooled receiver.

Mr. S. A. McDonnell read a paper on the preparation of Potass. Permanganate Pills. Mr. Grazer had examined some pills of Potass. Permanganate shortly after they were made, and found that three-fourths of the permanganate had already been decomposed. After some discussion upon this subject, the meeting adjourned at 10.20 P. M.

PHARMACEUTICAL MEETING.

HELD JULY 12, 1883.

Mr. McDonnell read a paper on the preparation of Volatile Liniment, and referred to the present use of Cotton Seed Oil, in preference to olive oil, which was somewhat expensive. The Liniment as usually made, separated. This was overcome by a few drops of Oleic Acid. He also exhibited specimens of various Liniments.

Dr. Martin, lately from Japan, read a paper on Scutellaria Lanceolaria, a Japanese plant belonging to the mint family. An analysis of the root had been made, showing the presence of a crystalline principle, having the following composition: C^{22} H^{7} O^{6}.

This was followed by a paper on the progress of Pharmacy in Japan.

Dr. Hoffmann of New York presented to the library "An Examination of Medicinal Chemicals," by Hoffman & Powers.

Mr. Heick presented Dr. Artin's Botanical Atlas.

Mr. Sommer mentioned a brief process for assaying ores.

Professor Runyon exhibited the Porcupine Pill-Coating Machine.

New members elected: Emile Roturier, San Francisco; Beverly S. Taylor, San Francisco; Val. Schmidt, San Francisco; Levi R. Ellert, San Francisco.

PHARMACEUTICAL MEETING (*Special*).

HELD AUGUST 13, 1883.

The object of the meeting was to elect a President to fill the vacancy caused by the resignation of Mr. Painter; to appoint delegates to the meeting of the American Pharmaceutical Association and to the National Retail Druggists' Association, to be held in Washington.

The Secretary read the President's resignation, the state of Mr. Painter's health causing him to leave the State.

Mr. Runyon being invited to the chair, called on the members to act upon the resignation.

Mr. Searby made some feeling remarks, and offered resolutions which were adopted.

The resignation was accepted, Mr. Fred. C. Keil was nominated to act as President for the remainder of the term. Mr. Keil was unanimously elected, the Secretary being instructed to cast the ballot.

Professor E. W. Runyon was nominated and elected to act as first Vice President.

Messrs. Painter and Wenzell were elected to act as delegates to the American Pharmaceutical Association.

A motion was also make and duly seconded, "that the Board of Trustees nominate such other members as may be going East about this time, and empower them to act as delegates." Mr. Searby moved "that the same delegates attend the National Retail Druggists' Association and Conference of Teaching Colleges," which meet about the same time; seconded, and carried.

Mr. Lengfeld suggested monthly instead of quarterly meetings.

PHARMACEUTICAL MEETING.

HELD DECEMBER 13, 1883.

The following new members were elected: R. W. Skinner, Eureka; Felix Lengfeld, J. H. Barbat, Albert Kern, San Francisco.

Mr. Searby read a communication received from J. W. Colcord of Lynn, Mass., accompanied by seeds of Rheum palmatum from St. Petersburg.

Mr. Sommer read a paper on the preparation of Bromhydric Acid, being a modification of Professor Markoe's process. This paper was the continuation of a previous paper upon the same subject.

Mr. Barbat read a paper on the preparation of Fl. Ext. of Wild Cherry Bark, dispensing with the use of alcohol in the menstruum.

Mr. S. A. McDonnell read some practical notes relating to the spreading of blisters. This paper was followed by one on Citrine Ointment.

Professor Runyon exhibited various pharmaceutical appliances. Professor Lengfeld presented a curiously shaped specimen of Ginseng and some ancient pharmaceutical works; also a specimen of Papayotine. President Keil showed some samples of Syrup of Hypophosphites of the late edition of the Pharmacopœia.

ANNUAL MEETING.

The Fifteenth Annual Meeting was held at the College Hall, on the evening of January 8th, 1885: President Topley in the chair.

The reports of the various officers were then read and accepted.

Mr. Calvert then read a letter from the Committee representing the International Pharmaceutical Conference to be held at Brussels, Belgium, which he was authorized to answer.

Prof. Wenzell read a paper on Cadaver Alkaloids, which was received with thanks, and referred to the editor for publication. Prof. Wenzell also presented the Society with a handsome specimen of Sulphuric Anhydride, which he had received from Germany.

Mr. Grazer presented the Society, in behalf of Messrs. Parke, Davis & Co., of Detroit, with an elegant assortment of pharmaceutical preparations made in the laboratory of this firm; also a very select lot of Cinchona Barks, and granulated effervescent Salts from Messrs. Keasbey & Mattison, of Philadelphia; an assortment of rare chemicals from Messrs. Rosengarten & Sons of the same place; and 30 different and characteristic specimens of Drugs from Messrs. Thorp & Lloyd Bros., of Cincinnati. A vote of thanks was tendered to all of these parties for their respective donations. Mr. Sommer moved to adopt at this meeting a method of balloting termed the proportional method. After some discussion, it was finally decided to proceed in the usual manner.

On motion of Mr. Rossi a Committee was appointed to draft a State Law to regulate the practice of Pharmacy and the sale of Poisons. The following new members were then elected, viz: D. Fletcher, John Laboyteux. The officers for the ensuing year were then nominated and duly elected (see page 2), after which the meeting adjourned.

SECRETARY'S REPORT.

To the Officers and Members of the California Pharmaceutical Society and College of Pharmacy,

GENTLEMEN: During the year just passed, four meetings were held; three regular quarterly, and one special meeting.

The last quarterly meeting was deferred, as a number of the members had devoted considerable of their time and attention to the College examination, which lasted a week, and could, therefore, not well attend. Another cause was that of deciding to hold the annual meeting in December, one month earlier than usual, with a view to issuing the College Prospectus at an earlier date; but as no notice had been given at the previous meeting, as required in the Constitution and By-Laws, this also had to be deferred.

A number of resignations have been sent in, and a number suspended for non-payment of dues. These have been duly submitted to the Board of Trustees. The Society has suffered the loss by death of one of its oldest and most respected members, Mr. Chas. Roturier. There has also been an increase in membership, being at present eighty-one.

The moneys collected for dues to date amount to $406, which was paid over to the Treasurer in the following sums:

April 22d, 1884	$105 50
July 5th, 1884	84 50
November 1st, 1884	84 00
January 3d, 1885	132 00
	$406 00

The last quarterly collections include dues up to December, 1884.

Very Respectfully,

FRED. GRAZER, Secretary.

Jan. 8, 1885.

TREASURER'S REPORT.

To the Officers and Members of the California Pharmaceutical Society and College of Pharmacy

GENTLEMEN: I herewith beg to hand you the Annual Report of my second year's incumbency:

1884.	RECEIPTS.		
Jan. 17..	To cash, balance on hand		$163 07
	For Acct. of California Pharmaceutical Society:		
April 21..	To cash from Secretary Grazer.....	$105 50	
Aug. 4..	" " Society Dues.....	84 50	
Nov. 3..	" " " "	84 50	
1885.			
Jan. 3..	" " " "	132 00	
			406 00
1884.	*For Acct. California College of Pharmacy:*		
Jan. 21..	To cash from W. T. Wenzell, acct. of building fund.....	$ 10 00	
Apr. 15..	To cash from W. M. Searby—Dean—students' fees.....	300 00	
May 19..	To cash from W. M. Searby—Dean—students' fees.....	400 00	
July 2..	To cash from W. M. Searby—Dean—students' fees.....	300 00	
Sept. 8..	To cash from W. M. Searby—Dean—students' fees.....	250 00	
Oct. 17..	To cash from W. M. Searby—Dean—students' fees.....	300 00	
Oct. 28..	To cash from W. M. Searby—Dean—	380 00	
1885.			
Jan. 5..	To cash from W. M. Searby—Dean—Balance.....	1 20	
			1,941 20
	Total.....		$2,510 27

Disbursements.

Acct. of California College of Pharmacy:

Journal of Pharmacy	$ 3 00	
Prof. Wenzell—Sundries	12 15	
Redington & Co.—Sundries	2 15	
College Announcements	71 00	
Labels for Specimen Bottles	9 00	
Attorney's Fees	150 00	
Redington & Co.—Specimen Bottles	78 14	
Book Case	55 00	
Prof. Runyon—Sundries	21 95	
Professors' Fees	1200 00	
Printing Examination Questions	20 00	
Commencement Exercises	111 25	
Rent of Ixora Hall	15 00	
Gold Medal	25 00	
		$1,773 64

Acct. of College Building:

Insurance	$ 58 50	
Interest for Eleven Months	110 00	
Painting	38 85	
Carpentering	24 75	
		232 10

Acct. of California Pharmaceutical Society:

Collector's Commissions, etc	$121 10	
Val. Schmidt—Sundries	7 75	
		128 85

General Expenses:

Water	$39 00	
Gas	82 85	
Secretary Grazer—Sundries	28 50	
Postage	4 00	
J. H. Dawson—Sundries	13 00	
Sundry Bills	14 70	
		182 05
By balance on hand		193 63
Total		$2,510 27

The receipts for the California Pharmaceutical Society for the year have been $406.00, and the expenditures $128.85.

The receipts for the California College of Pharmacy have been $1,941.20, and the expenditures $1,955.69.

Present Financial Condition of the Corporations:

ASSETS.

Real Estate—paid for Lot in 1882	$2,687 15
College Building—cost to date, furnished, with exception of Laboratory Room	6,675 12
Cash on hand	193 63
Total	$9,555 90

LIABILITIES.

Mortgage to Humboldt Savings and Loan Society	$2,000 00
Net Assets	$7,555 90

All of which is respectfully submitted.

E. A. SCHRECK, Treasurer.

SAN FRANCISCO, Jan. 8, 1885.

We, the Committee on Accounts, have examined the above report, and find it correct and properly vouched for.

VAL. SCHMIDT,
P. C. ROSSI.

REPORT OF THE BOARD OF TRUSTEES.

The Board organized Feb. 15th, 1884, Valentine Schmidt being elected Chairman, and W. M. Searby, Secretary.

Thirteen meetings were held, all of them being well attended.

The Twelfth Annual Lecture Session opened April 7th, and closed Oct. 27th. The number who presented themselves at the Preliminary Examination was nine, of whom six passed. The number of Junior Students who came up for examination at the close

of the session was eighteen, sixteen of whom passed. Of the Senior Class, eighteen were candidates for the degree, but as thirteen only were successful at the examinations, the graduating class was limited to that number.

The Receipts and Disbursements of the Dean were as follows:

RECEIPTS.

Matriculation Fees	$ 57 50
Lecture Fees	1,875 00
Diploma and Certificate Fees	98 00
Thesis Paper	4 85
	$2,035 35

DISBURSEMENTS.

Sundry bills, as per itemized statement,	$ 104.15
Paid to Treasurer	1,931.20
	$2,035.35

The total number of students in the College was fifty-six, of whom twenty-nine were in the Senior and twenty-six in the Junior Class, and one was a special student in Chemistry. Of the Senior Class, seven attended only a portion of the branches, and twenty-two were full-course students. Of the Junior Class, six took out only a part of their tickets, nineteen attended the full course, and one failed to take out his lecture tickets after matriculating. All of the students paid for their tickets, except one Senior, to whom free tickets were awarded at the previous year's examinations, one in each class, who attended on account of shares in the capital stock of the College, and seven who had attended on previous years, but had not passed the required examinations.

Respectfully submitted,

W. M. SEARBY,

Sec. of Board of Trustees.

NOTE.—The Dean's memorandum of incidental expenses connected with the College, amounting to $104.15, as above, was not presented to the Trustees until after the Treasurer's book had been balanced and audited. Hence, they do not appear in his account.

CURATOR'S REPORT.

During the present year the Society has been somewhat taxed to meet the outlay for the numerous repairs and additions found necessary, among which may be mentioned a library cabinet, a new set of Materia Medica specimen jars, etc.

The following Donations have been made to the College Apparatus:

One Remington Still, the gift of Prof. Remington, Philadelphia.
One Capsule Filler, the gift of Parke, Davis & Co.
One Drug Mill, the gift of Hance Bros. & White.
One Drug Mill, the gift of Enterprise Manufacturing Company.
One Microscope, the gift of F. C. Keil.

Chemicals presented by the following Firms:

By Rosengarten & Sons, Philadelphia.
By Parke, Davis & Co., Detroit.
By Keasbey & Mattison, Philadelphia.
By Mallinkrodt & Co., St. Louis, Mo.
By John H. Dawson, San Francisco.
By W. H. Campbell, San Francisco.
Materia Medica specimens by Lloyd Bros. & Thorp, Keasbey & Mattison, Redington & Co., J. J. Mack & Co., and others.

Library:

Mohr's Pharmaceutical Technik, F. C. Keil.
Hogg on the Microscope, F. C. Keil.
Cash donation, $2.75, by members.

All of which is respectfully submitted.

FRED. GRAZER, Curator.

Jan. 8, 1885.

ABSTRACT OF PROCEEDINGS

— OF THE —

California Pharmaceutical Society

— AND —

COLLEGE OF PHARMACY.

PHARMACEUTICAL MEETING (*Extra*).

HELD FEBRUARY 21, 1884.

Professor Searby presented specimens of Syrup of Iodide of Iron, made according to the method adopted in the late revision of the Pharmacopœia. He had made some experiments, and was satisfied with the results. Some discussion took place on this subject.

Mr. Rossi referred to a precipitate being formed when a Sol. Hypophosphite of Lime, Soda and Potasssium was mixed with a Sol. of Lactate of Iron; also that an odor of Phosphorus was developed, and the mixture became luminous in the dark. A number of suggestions were made as to the cause, and Mr. Rossi undertook the investigation as to the cause of the change.

The preparation of Boroglyceride was discussed. It was mentioned that the finished preparation was often of a dark color. This was shown to be caused by using commercial glycerine. The pure article should be used.

Professor Lengfeld exhibited some Jequirity Beans, a drug which had gained some reputation when used in the form of an infusion for the treatment of Ophthalmia.

Mr. Lautzenheiser presented a specimen of Poke root, sent from Grass Valley. Mr. Dawson exhibited a section of Rhubarb root having a kernel imbedded within it, which had evidently been grown over by that portion of the root.

The new specimen jars for the Museum having arrived, they were shown to the members present.

PHARMACEUTICAL MEETING.

HELD JUNE 12, 1884.

The meeting was called to order by Mr. Ryan, the President and Vice Presidents being absent. The minutes of the annual meeting and extra meeting were read and approved, after which Prof. Runyon called for action upon a notice given at a previous meeting, being an amendment to Art. III. of the Constitution—" All officers shall be elected at the annual meeting and shall hold office until their successors are elected "; to be amended to read as follows: " The President and Secretary shall hold office until the close of the annual meeting." It was moved to adopt the same, seconded, and carried.

The Secretary read letters sent Messrs. Searby and Wenzell from Mr. Ebert, desiring the opinion of the Pharmacists on the Pacific Coast as to the feasibility of holding the annual meeting of the American Pharmaceutical Association in San Francisco in 1886.

Prof. Runyon called attention to the matter, and desired to know the feeling of those present in the matter, nearly all of whom seemed to speak in its favor. As Prof. Runyon, of this city, and Mr. Holmes, of Walla Walla, were already a committee appointed by the American Pharmaceutical Association, the matter was left in their hands, Mr. Dawson being added to the committee.

Mr. Arthur Beckett next read a paper on Elixir of Gentian with Protochloride of Iron; the paper was accepted with thanks and ordered on file for publication.

Mr. Sommer exhibited samples of Oleate of Copper in a state of fine powder, which, upon examination, proved to be a Stearate of Copper.

Prof. Behr exhibited a specimen of the fruit of Hura Crepitans. Prof. Runyon presented the College with a Remington Still, on behalf of Prof. Remington, of Philadelphia; also a Raymond Capsule

Filler, from Parke, Davis & Co., by their agents Messrs. Blakleslee & Weck, in this city. Specimens were also exhibited of fixed Oil of Ergot and Japanese Extract of Malt.

Mr. Horstsnyder of Santa Cruz was unanimously elected a member. The meeting then adjourned.

PHARMACEUTICAL MEETING.

HELD SEPT. 11, 1884.

The meeting was called to order by Vice President Lengfeld. The Secretary read the minutes of the Fourteenth Annual Conference of the Schools of Pharmacy, held at the Arlington Hotel at Washington, D. C., Sept. 12th and 14th, 1883.

Mr. S. A. McDonnell read a paper on the preparation of Oleate of Copper; this was followed by a paper on the preparation of Oleate of Quinia; he also read a paper on the preservation of Ferrous Chloride.

Prof. Wenzell read a paper on Oleate of Copper, after which quite a discussion took place upon this subject. Prof. Wenzell then read an interesting paper upon the Volatile Oil obtained from the wood of the Oregon Cypress—Chamæcyparis Lawsoniana.

Mr. Val. Schmidt read an instructive paper on Practical Hints to Dispensers. All the papers read were received with thanks, and ordered on file for publication.

Prof. Runyon exhibited some Graduated Test Tubes and Poison Guards, made by Whitall, Tatum & Co., of Philadelphia; also a sample of Sulphuretted Mineral Water from the summit of Mount Shasta, obtained while on a visit to that place.

Dr. J. C. Heyerman, being recommended by the Board of Trustees for membership, was duly elected.

SELECTIONS

— FROM —

ORIGINAL PAPERS

Read before the Society.

CADAVER ALKALOIDS.

By W. T. WENZELL, Ph. G., M. D.

Whilst engaged in the capacity of analyst to the Coroner of San Francisco, a case presented itself to my notice, which, on account of the unusual results obtained, I believed to be, in a toxicological point of view, of interest to the profession.

In April, 1883, a jar containing a human stomach was sent in through a coroner's deputy for analysis, with the remark that an empty morphine bottle was found in the room of the deceased.

On opening the stomach, its contents, which measured six ounces, were quite fluid, showing that the food had been evidently digested up to the time of death. The inner coating of the stomach, along the course of its lesser curvature, was somewhat congested, and a few bright red patches were found scattered over the congested parts. No softening or abrasions were noticed, and, as the red patches faded away after a short time, these and the red appearances were deemed more the results of irritation than inflammatory action. A critical examination of the contents showed the presence of the skins of raisins and dried currants, which were readily identified by the unaided eye. A microscopical examination demonstrated the presence of wheat-starch and various other dark colored granular substances, which were, after patient research, resolved into fragments of black pepper, allspice, cloves and cinnamon. The presence of undigested muscular fibers was also shown by their striated appearance. The results of the examination showed that the decedent had evidently partaken freely of mince pie, shortly before death.

In order to corroborate this view a piece of mince pie was sub-

jected to an artificial digesting fluid of pepsin, muriatic acid and water in the proper proportions; a comparison of this digested mixture and the contents of the stomach gave corroborative results.

Course of Analysis. For the detection of metallic poisons, the usual method was pursued, using portions of the stomach and contents. The results were negative. For the elimination of alkaloids the method of Otto Stas was used. The alkaliod, which was separated by means of ether from the alkaline liquid, and transferred to acidulated water, as directed by this process, responded to the following tests:

Potassio-mercuric iodide gave a white precipitate; Iodo-iodide potassium a kermes brown precipitate; Tannic acid a white flocculent precipitate; Phospho-molybdic acid a yellow precipitate; chloride of gold a light brown precipitate; Mercuric chloride a curdy white precipitate; Platinic chloride no precipitate. To obtain the alkaloids, the hydrochlorate solution was made alkaline with ammonia, and shaken with an equal volume of sulphuric ether. The ethereal layer which held the alkaloid in solution left it, when transferred to a watch-glass for spontaneous evaporation, in the solid state. The alkaloid thus obtained gave evidences of crystallization. It was soluble in water, alcohol, ether, chloroform and amylic alcohol. It possessed a feeble alkaline reaction. When strong sulphuric acid was added to the solid alkaloid, an orange color was produced, which on careful heating changed to a crimson and finally to a claret color.

This reaction resembles in a degree the color reaction for Veratria, and also remotely that for Brucia and Delphinia; but it differs from these, that when the crystals of the alkaloid in question are exposed to the vapors of bromine under a bell-glass, they acquire a bright yellow or orange color. Veratria under the same circumstances is colored a fine cherry-red, and Delphinia a bright blood-red followed by a brown.

On treating Veratria with strong muriatic acid, it will dissolve to form a colorless solution, which, upon warming, produces a fine permanent red color. The alkaloid in question is also soluble in strong muriatic acid, but on heating no change of color was observed.

A search for morphia was instituted by means of amylic alcohol, but the results were negative.

The alkaloid in question was subjected, with the view to ascertain

its nature, to the following experiments: one-tenth of a grain of the alkaloid, dissolved in water, was injected under the skin of a Guinea pig. Death resulted in three hours.

The solution applied to the conjunctiva of the eye of a cat produced mydriasis lasting twelve hours. Judging from the poisonous effects produced by the alkaloid in question, may it not be reasonable to assume that it belongs to a class of bodies denominated Ptomaines or Septicins—substances generated from animal tissues undergoing putrefaction?

In this case it may, therefore, be assumed that the deceased had partaken of mince pie made from meat which had passed into a state of putrefaction favorable to the generation of a Ptomaine alkaloid, and that judging from its physiological action the alkaloid thus produced bore a resemblance to Atropia or Hyoscyamia, although its chemical characteristics are unlike either of these two. It is to be regretted that the name Septicin, first applied by Marquardt in 1876 to substances resulting from putrefaction, is now to a great extent displaced by the term Ptomaine (Cadaver poison), a name given by Selmi to alkaloids isolated from dead bodies. The word Septicin being more general in its application, it indicated not only a product of the Cadaver, but also that obtained from various other animal matters, capable, on account of their albuminoid nature, to pass into putrefactive decomposition.

The poisonous effects of putrid cheese, decomposed sausages, tainted fish and poultry are unquestionably due to the presence of these Septic alkaloids which may at times act with unexpected virulence; whilst, at other times, Septicins are formed which are comparatively harmless. It is for Science, however, to determine under what circumstances the poisonous and innocuous Septicins are produced.

Attention to these poisonous principles was first called by Marquardt in 1876, who noticed that a decomposing organic fluid produced fatal and rapid septicæmia when injected into the blood-vessels of animals. The same effect was produced when this fluid was first filtered, evaporated and extracted with alcohol, by means of which all micro-organisms were removed. This process yielded a substance also capable of causing septicæmia and death; and it was this substance that Marquardt named Sepsin or Septicin.

In 1879, Professor Selmi, of Bologna, announced that he had obtained from the decomposing human Cadaver, by Stas' method, a

substance possessing alkaloidal properties, which gave reactions of identity sometimes resembling those for Morphia, Codeia, Atropia, Delphinia, Conia, etc.

Since then the attention of chemists has been directed towards the study of Cadaver alkaloids, the results of which have demonstrated that the generation of these bases is not of uncommon occurrence in dead animal organisms undergoing putrefactive change; and that the toxicological chemist must now recognize a number of these, poisonous, non-poisonous, solid, and volatile.

But little is yet known regarding their chemical constitution and the conditions under which these different kinds are produced, as each case of putrefaction does not give birth to distinct principles. Bronardel and Boutigny have found the same alkaloid in the bodies of individuals who had died under absolutely different conditions.

Marquardt and his followers supposed that the Septicins were in some way or another connected with the various disturbances that follow wounds or injuries, such as Septicæmia, Pyæmia, Erysipelas and Puerperal Fever. Microscopy points towards bacteria as the cause of these disturbances, yet these might, after all, be merely accessory to the generation of septic poisons. Microscopists recognise two kinds of bacteria; one harmless, the other capable of producing or communicating virulent disease. Chemists recognize also two classes of Ptomaines, one harmless, the other poisonous.

So far, no connection has as yet been established between a harmless bacteria and a harmless Ptomaine, or between a bacteria capable of communicating Septicæmia and the Septicin which is said to have produced the same disease; but that such connection does exist seems probable.

Septic poisons are used by some Indians to poison their arrows. They use the deadly venom of serpents and insects, which they have learnt to intensify by mixing with decomposing animal tissues.

The Apaches prepare a poison for dipping their arrowheads, composed of the venom of the rattlesnake with the decomposing liver of a deer or antelope.

The Narrinjeries, natives of South Australia, moisten the bone splinters with the exudation of a decomposing cadaver with which they wound or scratch the skin of their enemies.

The late researches of Selmi have thrown light upon one of the darkest epochs of the history of toxicology, the time of Toffa and other professional poisoners, who understood how to make the

poisonous arsenic even more poisonous. This secret compound, known as Aqua Tofana, was employed in Italy during the latter part of the 17th century, and is said to have been discovered by a woman named Tofana, a native of Sicily. She confessed to having poisoned 600 persons. Her customers are said to have been chiefly young wives, who wished to get rid of their husbands. This poisonous compound was prepared by killing a hog, disjointing it, strewing the pieces with white arsenic, which was afterward rubbed in and allowed to putrify. The arsenical fluid which dropped therefrom was the poison used.

Contemporary with Tofana lived another celebrated poisoner, the Marchioness de Brinvillier, a French woman, who poisoned her father, her brothers and many others, after having been instructed by an Italian in the preparation of the poison. Her paramour died whilst preparing it, through the accidental breaking of the glass mask which he wore for his protection. The poison she used was of the nature of Aqua Tofana.

ON OLEUM CHAMÆCYPARIS LAWSONIANÆ.

By Prof. W. T. WENZELL.

This volatile oil I obtained on distilling the wood of the Oregon Cypress, also known respectively as White Cedar and Ginger Pine, a tree belonging to the Cupressus family.

Its habitat is in the vicinity of Mount Shasta, ranging thence northward, and along the Coast Ranges to Oregon. The tree is valuable for its timber, and also as an ornamental tree, for which it is much admired, and finds place in the public parks and many private residences of San Francisco. The wood is white, very fragrant, fine, and close-grained; is free from knots, easily worked, elastic, and very durable. The San Francisco Academy of Sciences has several cabinets made of this wood for the preservation of its entomological collections, the wood being considered, on account of its volatile oil, a sufficient protection against the ravages of insects. Numerous varieties have been obtained by cultivation.

The San Francisco market gets its supply of this wood principally from Oregon, where the tree grows most abundantly. The

fragrance of the wood depends altogether upon the presence of a volatile oil which is diffused throughout the entire trunk and branches of the tree, but more so at the base near the crown of the root, where it abounds in the largest proportion. In trees growing in very moist soil, the amount of volatile oil found near their base is often as high as fifteen per cent.

On account of the large percentage of volatile oil contained in the wood, the Oregon Cypress can only be sawed in mills having their sides all open; since it has transpired that when the sawing was done in the common enclosed saw-mill, the mill-men invariably suffered from strangury, bloody urine, and not unfrequently from attacks of dangerous nephritis.

For the first distillation, one pound of finely chopped wood, rich in oil, was used, and distillation continued as long as any oil passed over. The amount obtained was two fluid onnces, nearly twelve per cent., a yield unusually large.

In order to ascertain whether the oil was homogeneous in its composition, or a mixture of several oils, sixteen fluid ounces of the mixed oils, the result of several distillations, having a specific gravity of .9215, were subjected to a fractional distillation.

This process was effected in a liter flask, into which was inserted a two-bulb tube, connecting with an upright Liebig's condenser. Into the tube a thermometer was inserted, passing through a cork down to the center of the upper bulb. The connection between this apparatus and the condenser was made by sliding the side tube of the former into a larger tube connecting also with the condenser, as on account of the high boiling points of the heavier portions of the oil, no rubber connections could be used.

The following gives the several fractions obtained, with their specific gravity, and the temperatures indicated by the thermometer:

Fractions.		Temperature.	Specific Gravity.
(1st.)	1¾ oz.	105°—162° C.	.857
(2nd.)	4½ oz.	162°—170° C.	.867
(3d.)	3¼ oz.	180°—190° C.	.893
(4th.)	½ oz.	190°—200° C.	.932
(5th.)	2 oz.	220°—236° C.	.990
(6th.)	1½ oz.	236°—246° C.	.940
(7th.)	1½ oz.	250°—400° C.	.930
(8th.)	2 oz.	Residue.	
(9th.)	1½ oz.	Loss and Water.	
	16 oz.		

It must be observed that during the distillation it was noticed that the third, fourth, and fifth fractions were accompanied by a separation of water and acetic acid, causing a violent bumping of the contents of the flask, which was difficult to control, even when platinum foil was added. The separation of water and acetic acid at this stage of the distillation is evidently the result of dissociation of one or two of the oils. On an inspection of the results of the fractioning, it will be seen that the Oil of Chamæcyparis will probably be resolved into four distinct oils, the elementary analysis of which, together with the study of their leading physical and chemical properties, I shall personally reserve for a future paper.

ON THE PREPARATION OF OLEATE OF COPPER.

By Prof. W. T. WENZELL.

Having had occasion to prepare a considerable quantity of this compound on short notice, and desiring an expeditious method, and at the same time a simpler one than that of precipitating a soluble salt of copper by means of an alkaline oleate, I hit upon the plan of using sub-acetate of copper for the purpose, believing that oleic acid, assisted by heat, was capable of displacing acetic acid in this copper salt. Actual experiment demonstrated the feasibility of the plan. On heating oleic acid on a water-bath, adding powdered sub-acetate of copper gradually, acetic acid and water escape with effervescence, with the formation of oleate of copper.

The following reaction explains the process:

$$\left.\begin{matrix} Cu \\ O \\ Cu \end{matrix}\right\} \begin{matrix} -C_2H_3O_2 \\ \\ -C_2H_3O^2 \end{matrix} + 4H\,C_{18}H_{33}O_2 =$$

$$2\,Cu\,(C_{18}H_{33}O_2)_2 + H_2O + 2H\,C_2H_3O^2$$

Cupric Oleate — Acetic Acid

Working Formula.

Oleic Acid oz. ii vel q. s.
Cupric Sub-acetate dr. vi.

As the cupric sub-acetate is not of constant composition, in many cases a larger quantity of oleic acid may be required. The plan should be, to add afterwards a small amount of oleic acid, and if effervescence continues, add more of the acid until it ceases.

HYDROBROMIC ACID.

A SHORT REVIEW OF THE PRESENT METHODS OF PREPARING BROMHYDRIC ACID, AND A DESCRIPTION OF A PROCESS FOR PREPARING IT FROM BROMIDE OF ZINC AND SULPHURIC ACID.

By AD. SOMMER, PH.G.

The methods recommended for preparing bromhydric acid may be grouped into four classes :

1*st Class.* Direct combination of bromine and hydrogen.

2*d Class.* Decomposition of hydrogen compounds by bromine.

3*d Class.* Decomposition of the compounds of bromine with the solid metalloids by the action of water.

4*th Class.* Decomposition of metallic bromides by acids.

FIRST CLASS. DIRECT COMBINATION OF BROMINE AND HYDROGEN.

Br and H do not combine at ordinary temperatures, not even under the influence of direct sunlight. To effect their union, an elevated temperature is necessary.

(*a*) Br and H are brought in contact with a Platinum wire, kept at red heat by the electric current.

(*b*) Br and H are passed over warmed Platinum sponge.

(*c*) Br and H are passed through a red-hot Platinum tube.

(*d*) Br and H are brought in contact with a flame or the electric spark.

The writer has had no personal experience with any of these processes, but, according to the statements of other experimenters, these methods are, although the simplest in theory, the most difficult in practice. For, on account of the corrosive action of the compounds, the apparatus can only be made of glass, porcelain, soapstone, or platinum; and to make the joints so tight that neither Br nor HBr can escape is almost impossible. The product is in all cases contaminated with Br, unless the latter be removed by passing the gaseous acid over either phosphorus or antimony. An elaborate apparatus, wherein the union of Br and H is effected by their passage through a red-hot Pt tube, has been devised by Mr. A. Harding, at Berkeley, Cal., where it has been employed at the laboratory of the University of California in preparing a fuming solution of HBr, containing 65 per cent. and over of HBr. See *New Remedies*, 1882, p. 43. Wherever a pure anhydrous acid is required, these methods are preferable to all others.

Second Class. Decomposition of Hydrogen Compounds by Bromine.

Bromine separates hydrogen from most hydrogen compounds, notably from hydrogen phosphide, hydrogen sulphide, hydrogen iodide, ammonia, volatile oils, fixed oils, resins, alcohol, ether, etc.

Under the influence of direct sunlight, bromine gradually liberates oxygen from water and forms HBr. When the mixture of bromine and water is brought into contact with substances which have an affinity for oxygen, such as sulphurous acid, arsenious acid, metals, etc., the formation of HBr goes on rapidly.

(*a*) Hydrogen-sulphide is passed into a mixture of bromine and water. When little water and much bromine are employed, gaseous HBr escapes, and is conducted into water. The aqueous solution of HBr so produced is then boiled until it no longer smells of H^2S.

When much water and comparatively little Br are employed, an aqueous solution of HBr is formed at once.

In both cases bromide of sulphur is formed simultaneously with HBr, and must be decomposed by boiling, whereby free sulphur, sulphuric acid, and an additional quantity of HBr are produced.

Unless further purified, the products are always more or less contaminated by one or more of the following substances: Br, H^2S, H_2SO_4.

(*b*) Hydrogen sulphide is passed into a solution of bromine in bisulphide of carbon covered by a layer of water. HBr is formed from the Br and H_2S and absorbed by the water, while the liberated S is retained by the CS_2. The watery solution of HBr has to be boiled in order to free it from H_2S and CS_2, but it, too, contains H_2SO_4.

(*c*) Bromine is passed into paraffine which is kept at 185 deg C. One half of the Br forms bromine derivatives of the paraffine, while the other half unites with the H liberated to form HBr. By continuing the heat, the bromidized paraffine is again split up, yielding an additional amount of HBr.

(*d*) Bromine is mixed with sulphite or thiosulphate of soda and a small quantity of water. Here the water is decomposed, and sulphate of soda and HBr formed. The HBr escapes and is conducted into water. When the evolution of HBr slackens, heat is applied. A considerable portion of HBr is, however, retained by the saline mass, and cannot be conveniently recovered.

The principal objection to all of these methods is their waste-

fulness in material. In (*a*) and (*b*) the quantity of H_2S that has to be generated, in order to effect the conversion of the Br into HBr, is many times larger than the theory would indicate, since most of it passes off into the air. In methods (*c*) and (*d*), on the other hand, the yield of HBr does not correspond to the amount of Br employed, because a considerable portion of Br is retained by the residues.

Third Class. Decomposition of Compounds of Bromine with Solid Metalloids by the action of Water.

Bromine unites readily with some of the solid metalloids, notably with arsenic, sulphur, antimony and phosphorus; and these bromides in contact with water decompose into HBr and the hydrated oxides of the metalloids.

(*a*) Bromide of Sulphur.—A mixture of Br and S is heated with water, and thereby decomposed into HBr, H_2S and H_2SO_4. The acid is very impure, and must be rectified.

(*b*) Bromide of Antimony.—Regulus Sb is digested with Br, and the bromide decomposed by an excess of water. Antimonous oxide is precipitated, and HBr remains in solution. On distilling, however, traces of Sb will appear in the distillate.

(*c*) Bromide of Phosphorus.—Bromine is gradually introduced into a mixture of phosphorus and water or phosphorus and ice, which mixture is kept cool by means of water or ice. Either common P. or the red variety may be used. PBr^5 is first formed, but decomposed as soon as it comes in contact with water into H_3PO_4 and HBr. The HBr is finally separated by distillation.

This process gives excellent results when carefully executed; but on account of the danger of an explosion, the greatest care must be exercised never to allow a large quantity of Br to come in contact with the P. The writer has found the following method safe and profitable: Into a glass flask of a capacity of two gallons is poured one gallon of water; about one and one half pound of ordinary phosphorus is added to this, and the flask placed in a large basin of cold water.

A globe-shaped separatory funnel is, by means of a perforated stopper, loosely fitted on the flask, in such a way that the end of its tube dips into the water within the flask.

When everything is in order, the funnel is lifted out, filled with bromine, and the stopcock opened just sufficient to allow about

sixty drops of Br to be discharged in a minute. The funnel is then again transferred to the flask, and the Br allowed to drop in at the rate just stated. After about four to five pounds of Br have been added, the flask is warmed until the mixture is colorless, then allowed to cool, the liquid portion poured off, the P rinsed with a little water, and the washings added to the first liquid. Through the mixed liquids is passed a slow current of H_2S, until all As is precipitated as As_2S_3 and the supernatant liquid is perfectly clear. The solution is then filtered, the As^2S_3 washed, the filtrate poured into a glass-stoppered tubulated retort, which is connected with a glass condenser and heated by an oil-bath, and the HBr distilled off. The first portion of the distillate is rejected, since it smells strongly of H_2S and contains hardly any HBr; the odorless portion is preserved in glass-stoppered bottles.

Although the principal products of the reaction between bromine, phosphorus, and water are, as already stated, HBr and H_3PO_4, there are also formed small quantities of phosphorous acid and arsenious acid. The former may be produced by the spontaneous oxidation of the P after all free Br has disappeared, while the latter is due to the presence of As in commercial P. By an experiment it was found that on distilling the mixture of acids just as it is decanted from the P, the whole of the As will appear in the distillate. The treatment with H_2S became, therefore, necessary, and it accomplishes in this case the complete precipitation of the As in less than twelve hours.

The quantity of the distillate necessarily varies with the amount of water in the mixture of acids. But if a strong acid is desired, it is only necessary to remove the first portions that distil over, and are of a low sp. gr. The greater bulk of the HBr distils as a hydrate of the sp. gr. 1.4804 at 15° C., which contains 47.12 per cent. of HBr. At no time, but particularly not during distillation, should the pure HBr be allowed to come in contact with organic substances, such as cork, India rubber, paper, etc., since these substances induce decomposition of the acid, liberating Br. The connections between the retort and condenser should therefore be made of glass only. The phosphoric acid which remains in the retort is, though not pure, yet a useful by-product.

When carefully executed, this method gives almost the theoretical yield.

Fourth Class. Decomposition of Metallic Bromides by Acids.

A great many mineral acids, as well as several organic acids, liberate HBr from metallic bromides. Those employed in practice are sulphuric, phosphoric, and tartaric acids.

Of these, however, sulphuric acid, when of considerable strength, will liberate Br along with HBr, the H_2SO_4 itself being decomposed into SO_2 and H_2O. A number of experiments were made by the writer for the purpose of ascertaining the highest strength of sulphuric acid that can be employed for making HBr without giving rise to these secondary products (SO_2 and Br), and it was found that, so far as bromide of zinc is concerned, any acid containing less than 80 per cent. of H_2SO_4 can be employed without danger.

(*a*) Decomposition of potassium bromide in water by means of tartaric acid, and decanting the aqueous acid formed from the precipitated bitartrate of potassium. The product contains some undecomposed bromide of potassium, as well as bitartrate. The latter may be more completely removed by the addition of alcohol, filtering and expelling the alcohol by evaporation. The acid produced by this method is very liable to decomposition on keeping; the writer has never seen any such acid which did not in time turn yellow.

(*b*) Decomposition of barium bromide by means of dilute sulphuric acid, decanting the aqueous acid and distilling.

The barium bromide required for this purpose is made either from barium carbonate and ammonium bromide, or from barium sulphide and bromine. When made by the former method, it necessitates first the production of dry NH_4Br by adding Br to ammonia water and evaporating to dryness. The dry salt is then heated with an equivalent quantity of $BaCO_3$, whereby ammonium carbonate is formed and volatilized, and $BaBr_2$ left behind. When the latter method is employed, sulphate of barium is mixed with powdered charcoal or coal tar, packed into a covered crucible, and heated to bright redness for some time. The resulting sulphide of barium is then mixed with water and Br, the mixture boiled, the solution of $BaBr_2$ filtered off and evaporated to dryness.

In order to prepare HBr from $BaBr_2$, a known quantity of the latter is dissolved in water, and somewhat less than the equivalent amount of H_2SO_4 added. The mixture is then allowed to settle, the clear liquid decanted, the precipitate washed with water, the washings added to the liquid, and the mixed liquids distilled.

On the whole, this method is a lengthy one, although the product will be pure, when due attention is paid to every particular.

(*c*) Decomposition of potassium bromide by phosphoric acid, and separation of the HBr by distillation.

The product is pure, provided the materials were so; but the cost of the phosphoric acid prevents the general application of this method.

(*d*) Decomposition of potassium bromide by means of sulphuric acid, allowing the potassium sulphate to crystallize out, separating the salt from the liquid, and distilling the latter nearly to dryness.

Potassium bromide is an expensive source of Br to the retail pharmacist, when he has to buy it from the wholesale dealer. To make it himself in small quantities from a solution of potassium hydrate and Br, evaporating, igniting with charcoal, redissolving, filtering and evaporating, is both tedious and unprofitable. Often the commercial bromide of potash contains bromate, and the acid will then contain three molecules of free Br to every molecule of bromate. Another unavoidable impurity of the distillate is sulphuric acid, from which, however, it may be freed by a rectification over barium bromide.

(*e*) The preparation of HBr from bromide of zinc and sulphuric acid, as originated by the writer.

For the sake of convenience I shall divide this process into two parts:

1st. The preparation of bromide of zinc.

2d. The distillation of bromhydric acid.

The Preparation of Bromide of Zinc.—Zinc readily dissolves in a mixture of water and Br. The solving action, however, goes on faster when the solution has acquired a somewhat higher specific gravity than that of ordinary bromine water, but is retarded when the solution becomes nearly saturated with bromide of zinc. In order, therefore, to utilize this peculiarity, I pour the whole quantity of Br I intend to combine with Zn into a glass flask, which already contains a small quantity of water, and insert a few strips of Zn, which must protrude above the surface of the Br layer. The action soon commences, and is most energetic a little above the surface of the Br. When it has once fairly started, large bubbles of a colorless gas will be seen rising from the body of the Br, the nature of which gas I have not yet determined. An increase in temperature also accompanies the reaction, and it is therefore well to keep

the flask in a basin of cold water, and to add only a small quantity of Zn at one time. When, after repeated additions of Zn, the aqueous layer becomes so dense that the Zn does not readily dissolve any longer, some water is added, and the additions of Zn and water repeated so long as there is any Br left. At last an extra piece of Zn is added, and the vessel allowed to stand for some time in a warm place. This excess of Zn serves to remove most of the impurities that are generally present in commercial Zn, and particularly those which are liable to be volatilized during the distillation of the HBr, namely, arsenic, antimony and lead. When as much of the impurities as is possible in this way have been removed, the solution is rapidly filtered and evaporated in an evaporating dish. Towards the end of the evaporation, when a pretty good heat is required to remove the last portion of water, the dish, merely protected by a piece of wire gauze, should be placed over the direct flame, and the solidifying mass constantly stirred until it begins to fuse on the edges. The now granular salt, while still hot, is transferred into tightly stoppered bottles, since it is very deliquescent. Considering the ease with which $ZnBr_2$ can be obtained in a tolerably pure state, when compared with the difficulties encountered in the production of other bromides, and further, the advantage it has over Br in being readily handled and safely transported, it is to be hoped that it may soon become an article of commerce. If made by the bromine manufacturer and sold cheaply, it might be made to serve as a source for Br, which would not be objectionable to the transportation companies.

The Distillation of Bromhydric Acid.—According to the statements of several investigators, aqueous bromhydric acid, when boiled under a pressure of 760 mm., has the tendency to form a stable hydrate, containing five molecules of water to every molecule of HBr, which hydrate distils at 125° C. That is to say: when an aqueous acid is boiled under the ordinary atmospheric pressure, it will either lose water if it contains more than five molecules of water to every molecule of HBr, or HBr, if the proportion is a smaller one; and it will continue to do so until there remains a liquid containing the above proportions, which will then distil over unchanged. This, however, applies, as the writer has found, only to a pure acid. In the presence of salts, and possibly also in the presence of other non-volatile acids, the last portions that distil are much stronger in HBr. In my experiments I therefore sought to

obtain this stable hydrate, and I believe to have found a method of doing so. I take bromide of zinc, 225 parts; distilled water (including the water contained in the sulphuric acid), 180 parts; sulphuric acid (calculated as H_2SO_4 without water), 196 parts. The $ZnBr_2$ is placed into a tubulated, glass-stoppered retort, whose neck is bent at an angle of about 90°, and drawn out to a fine point. The water is poured on the bromide, and agitated until solution is complete. Then the sulphuric acid is added (which in this case does not liberate an appreciable amount of heat), the glass stopper tightly inserted, and fastened by a string or wire. The body of the retort is then placed in an oil-bath, the neck inclined and dipped into an empty receiver, which is standing in a larger vessel and is surrounded by water. The oil-bath is then heated rapidly, the distillation carried on as fast as possible, and the heat only lessened when excessive bumping occurs. So long as there is a considerable amount of liquid in the retort, the operation requires scarcely any attention after the heat has been once properly regulated. But when the residue in the retort is nearly dry, and the evolution of HBr slackened, close attention must be paid lest the liquid should be drawn back and fracture the retort. As soon as the liquid rises in the narrowest terminal portion of the neck, the receiver is removed, the retort cooled and cleaned.

It was found advantageous to place the neck of the retort so far into the receiver that the small orifice would be submerged in the condensed liquid, especially towards the end of the process, when a nearly anhydrous acid passes over. There is, with proper attention, no danger from the condensed liquid being sucked back, provided the orifice is made small enough, and the surface of the retort neck, to which the vapors are exposed, be so protected against the cooling effect of the air that no condensation, or at least only a partial one, can take place before the vapors reach the receiver, insuring thereby a constant outward pressure of the vapor from the retort. To the distillate, which contains a considerable amount of H_2SO_4 is added $BaBr_2$ or $Ba(OH)_2$ or $BaCo_3$ in excess of the H_2SO_4, and the whole again distilled to dryness. The residue from this last operation is exhausted with water, the solution evaporated to dryness, and the $BaBr^2$ so obtained, preserved for the next operation.

It might appear that the rectification over $BaBr_2$ could be dispensed with by employing an excess of $ZnBr_2$ in the first distilla-

tion. This, however, is not the case, since by actual experiment it was found that H_2SO_4 distils over, even when $ZnBr_2$ is employed in a large excess. When equivalent quantities of H_2SO_4 and $ZnBr_2$ are employed, a portion of $ZnBr_2$, equivalent to the amount of H_2SO_4 that has evaporated, is left undecomposed. Since, therefore, $ZnBr_2$ is more expensive than H_2SO_4, and no advantage is derived from employing the former in excess, it is preferable to use an excess of H_2SO_4. There is still another advantage in using at least twice the theoretical amount of sulphuric acid, namely, the fluidity of the residue in the retort. Not only is thereby the cleansing of the retort greatly facilitated and its liability of being fractured lessened, but it also enables the heat to penetrate the residual mass better, and expel the last portion of HBr quicker than could be the case if, on account of an insufficient amount of H_2SO_4, a hard cake of $ZnSO_4$ was formed at the bottom of the retort.

In an experiment made according to these directions, I obtained 81.7 grams of bromhydric acid from 56.25 grams of $ZnBr_2$, 63 grams of 78 per cent. sulphuric acid, and 31 grams of water. The sp. gr. of the acid at 15° C. was 1.48, and its strength determined by the volumetric solution of KOH 47 per cent. of HBr. Hence its molecular composition was almost exactly 1 mol. HBr to 5 mol. H_2O. It is therefore safe to express the reaction by the following equation:

$$ZnBr_2 + 2H_2SO_4 + 10H_2O = ZnSO_4 + H_2SO_4 + 2\,(HBr.\ 5H_2O.)$$

ON BLISTERS.

By S. A. McDONNELL, Ph.G.

It would seem that there are but two ways to do anything—a right and a wrong way. Happening to be in a friend's store lately, I found the clerk mixing an ointment on a piece of cardboard. I ventured to remark, "Why not use the *pill tile?*" "I would have to wash it, while this I can throw away." But it is in the spreading of blisters that I meet with the greatest lack of uniformity. One man prides himself on his ingenuity, as follows: He takes a roll of adhesive plaster (with its still adhering surface paper), measures out the square he desires by his rule, allowing an inch

margin. Then he carefully cuts with his penknife along the line, so as not to penetrate the plaster, but to cut through the adhering paper only. The paper inside the square is then carefully removed and set aside to serve as a cover for the blister when finished. But this plan takes too much time. Another takes strips of paper and pastes them along that part of the plaster which is to serve as the margin, and then proceeds as usual. Still another takes the cut strips of paper, and having laid them along over the marginal portion of the plaster, draws a heated spatula over the paper (with care), which makes the strips adhere. Still another cuts the exact dimensions of the intended plaster from out of a piece of stiff paper, and having placed it upon the plaster, drives a tack through both, at each corner, into the counter; and then the exposed portion of the plaster is covered over with the cerate. Still another has a tin contrivance with an adjustable cover. Still another has a solid block of wood with brass straps extending over the surface which is *convex one way*—two crossing lengthwise and two crosswise—adjustable to any size less than the size of the block upon which they are operated. And so on *ad infinitum*. The trouble, in most stores, amounts to this—that there is a great lack of anything in the shape of a contrivance for this purpose. Hence it is that the *master spirit* usually resorts to such expedients as his fancy—not always brilliant—sets up. Thus, having settled the preliminaries, the plaster is now to be spread; and here, again, comes in a great diversity. Some light a spirit lamp, in the flame of which, having heated a spatula, pieces of the cerate are dug out of the jar with the same, and applied to the plaster. Others hold the spatula in the flame of a gas jet (not a Bunsen); and I have seen it held over the flame of a coal oil lamp, which adds an abundant supply of carbon to the plaster; and so, with frequent touches of the heated spatula, the blister is finally spread over the required surface; and then it does not, in many cases, present an even surface; and the time taken to do all this is very considerable. There is no excuse for a man to consume three fourths of an hour in spreading a blister. Of course, I have not observed these things without having a way of my own. During any leisure moments, select from your windows such pieces of card board signs as you may desire for the purpose. Cut squares out of them, such as 4x4, or 6x6, etc., leaving a margin, and place them on a nail or peg convenient for use when wanted—the size being marked on the mar-

gin. Now comes in an order for a blister. Select the size wanted, remove it to the counter, take your adhesive plaster, cut from it a piece about the size of your square (including the margin), and spreading it out on the counter, lay your blister form over it. Then from your cerate jar remove of the cerate rather more than is necessary to complete the entire blister; work it between your hands until it is quite pliable. When ready, place the fingers of the left hand firmly on the margin of the form nearest to you, the ball of cerate being in the right hand; spread it with the under part of your thumb, pushing the thumb directly in front of the fingers that hold the form—the pressure from which must be greater than the force exerted by the thumb. Having spread the cerate all over the plaster, turn it around, and level the furrows left by the first operation; then take a stiff spatula, and placing it edgewise at an angle of 45°, draw it firmly and evenly, without any depression in the middle, across the blister, the edge of the spatula bearing on the margin of the form used for a guide, the left hand always pressing down on the margin, while the right hand draws the spatula in an opposite direction. Turn the plaster, and repeat from each of the four sides, if necessary. Should the blister be a very large one, there is in the market a fourteen or fifteen inch rule, that has a brass edge placed along its beveled edge (for paper cutting, etc.), one sweep of which, either way, across the blister, in the manner previously described, leaves nothing to be desired in the way of quickly performing this operation.

LINIMENTUM AMMONIÆ.

By S. A. McDONNELL, Ph.G.

I have never dispensed the above liniment without feeling that it was like "gilding gold" or "painting the lily," to use the expensive olive oil ordered in the pharmacopœia, when a much cheaper oil should do just as well; therefore, I rejoiced when the new pharmacopœia came out, stating that cotton seed oil (which is much cheaper) was to be used. It compares, in appearance, very favorably with the best olive oil; but when used in preparing this liniment, the product separates, on standing, into two portions. Hence

the occasion for this paper. The new dispensatory (W. R. & S's), however, offers this apology: "The substitution of cotton seed oil for olive oil is an important, *practical* (?) improvement. A liniment is now furnished which is liquid at ordinary temperatures. The Ammonia Liniment of the U. S. P., 1870, is usually solid and unmanageable. *Complete saponification is not a desideratum in this liniment.*" Nevertheless, the general public wants a whitish, creamy looking liniment that will *not separate;* and the pharmacist who dispenses any other than that sort of a compound will not satisfy his customer. Certainly, I think it an improvement to have the liniment a fluid, and prefer the happy mean to any extreme. But take cotton seed oil, and add to it three per cent. of oleic acid (common, red, commercial oleic acid); shake, then add the Aq. Ammon.; and again shake, and you will have a liniment which is all that can be desired—a whitish, creamy fluid, and that does not separate, and economical, withal. The expressed oil of mustard seeds, which is so abundant on our Coast, and quite cheap (but not so cheap as cotton seed oil), could be used in the same way, but will require five per cent. of the oleic acid to make a permanent mixture; but, alas, it possesses a yellowish color (too deep) when mixed, that would militate against its use by the over fastidious connoisseur. The following formula will be found to answer with any of the cheaper oils.

℞ Acidi Oleici.....2 parts.
Olei Gossypii Seminis..68 parts.
Aquæ Ammoniæ.....30 parts.
Misce. fiat linimentum.

The object of this paper is not to find fault, nor to cry down the efforts of others, but rather to devise a way whereby the cheaper oils could be utilized in the preparation of this liniment with as much satisfaction and without any disadvantage as compared to other more favored oils; and I think that an examination of the numerous samples herewith shown will bear out the conclusion that the addition of a small portion of oleic acid to the oil (cheaper oils—as mustard, Union salad oil, cotton seed oil, etc.) is a point worth remembering.

CARD SPATULAS.

By S. A. McDONNELL, PH.G.

It often happens that Citrine Ointment is prescribed in conjunction with other things that cannot be mixed as satisfactorily on a pill tile as in a mortar. The ointment having been mixed, it becomes a source of annoyance to properly transfer it to the jar in which it is to be dispensed. This difficulty may be very easily surmounted by taking an ordinary business card between the tips of the fingers and the thumb, and by a dexterous twist or two of the wrist, it will have been removed, leaving the mortar quite clean.

PERMANGANATE OF POTASSIUM IN PILLS.

By S. A. McDONNELL, PH.G.

"What is a good excipient for pills of Permanganate of Potassium?" Knowing how exceedingly prone to decomposition this salt is, when in contact with organic matter, I have endeavored to find an excipient which would not be incompatible with it, and offer the following as meeting that requirement.

℞ Potassi Permanganatis gr. x.
Olei Theobromæ sc. i.
Olei Olivæ q : s :
Misce, fiat massa, in pilulas decem dividenda.

Break up the butter of cacao in a mortar, with the pestle, until it is no longer lumpy. Having previously powdered the Permanganate, add it to the butter of cacao, and mix them well together; then add the olive oil, in small portions at a time, until you have reduced the mixture to the plasticity of a good pill mass. (If you have not used enough of the olive oil, it will surely crumble, and will take much longer to finish.) Remove from the mortar, and with powdered French chalk roll it out, and cut it into pills. Those that I have here for your inspection will compare in finish with the best uncoated pills. They keep well; the only caution necessary being not to place them in a too warm location, lest they should melt.

Test: I made up a lot of the pills after the foregoing formula, and about a month afterwards I placed one of the pills in some water contained in a porcelain capsule. Having applied heat, the pill soon melted, when the oily portion floated to the surface, and the water assumed the beautiful purple color characteristic of the salt.* Can we say as much for Nature's laboratory—the stomach?

NOTE: Since writing the foregoing, my eye has accidentally fallen upon an article in the W. D. N. and Am. Phar., Feb. 17th, wherein a subscriber says that he has tried Ol: Theobr: but it is not quite satisfactory. In the New Rem. for April is a paper by Drs. Ringer and Murrell (copied from the Lancet), who, in the course of their remarks say—cacao-butter, etc., is troublesome to manipulate. I have not found any difficulty in following the above process.

PRACTICAL HINTS TO DISPENSERS.

By VALENTINE SCHIMDT.

There are many things behind the prescription counter which are of great advantage to the dispenser, that cannot be learned from text-books, but must be acquired and worked out by actual experience and careful observation.

Theoretical training should be the foundation of every pharmacist, upon which he builds the superstructure of practical knowledge by hard labor and never-tiring effort.

The practical part is, commercially speaking, of the most value, since the success of a prescription clerk depends largely upon his ability to dispense his pills neatly, correctly, and with dispatch. His suppositories must be of proper shape, and his ointments well incorporated; while his plasters should appear as if made by machinery. Every move he makes should count, enabling him to deliver his "physic" to the patient in as brief a time as possible, which will be duly appreciated by all parties. He should be able at a glance to decide how to proceed with a prescription, as hesitation creates distrust.

* While this test shows the presence of some permanganate, it by no means proves that a large portion of it has not been decomposed.—ED.

PILLS.—In making pills, care should be taken in selecting the proper excipient, so as not to impair their solubility. The following formula has given better satisfaction than any I have found, and may be prepared at any time in a few minutes:

℞. Pulv. Tragacanth .....3 drachms.
Glycerine .....3 ounces.
Distilled Water .....½ ounce.

Place the tragacanth in an ordinary four or six ounce jar, and mix the glycerine with it until a homogenous mixture is obtained; then stir in the water, and in ten minutes the paste is ready for use.

It is white, semi-transparent, very plastic, never hardens or decomposes, and may be used in at least 75 per cent. of all prescriptions where an excipient is necessary.

Pills made with this preparation will remain soft and soluble.

Fifteen per cent. is sufficient to make quinine into a plastic mass, which may be kept in stock, always ready to be rolled out into pills whenever wanted, making allowance for excipient.

By using the mass instead of the powder, in prescriptions where other ingredients are ordered, fifty per cent. valuable time may be saved.

In making citrate of iron and quinine pills, I use the paste q. s. to make a soft mass, then adding powdered licorice root or marshmallow to roll out a stable pill.

OINTMENTS.—These are often the primary causes of a good deal of profanity, especially when the solid extract ordered is hard and tenacious, and must be softened before it can be utilized. To accomplish this, it is usually put into a capsule and heated with water until it becomes liquid.

The disadvantages in this process are:

1st. The danger of too much water, especially when vaseline is ordered.

2d. Serious loss by adhesion to the capsules, thereby weakening the product.

3d. The loss of valuable time.

I have adopted the following *modus operandi*, which, for simplicity and accuracy, should commend itself to any one:

Upon receiving a prescription for an ointment containing a solid extract, the first thing I do is to place a small tea-kettle I have for general use on the gas stove, with an ounce or two of water. By

the time the extract is weighed out the water is boiling furiously, sending forth a blast of steam through the nozzle, which I utilize by holding the extract placed upon a spatula into the steam, which softens it in a few seconds (according to bulk), at the same time furnishing the necessary moisture, allowing it to be easily rubbed up on a slab, and mixed with lard, vaseline, or cacao butter.

SUPPOSITORIES.—Much has been said about making suppositories; many different kinds of excipients have been suggested, and innumerable styles of moulds have been invented; and yet, when a prescription for suppositories is handed in, all the dispensing clerks appear very busy just then, especially if dinner-time is approaching.

The best mould I have found for ordinary purposes is that made by L. R. Blackman. It is circular, nickel-plated, all metal, with twenty-four moulds, making a thirty-grain suppository of good shape; but I never use it except for stock, preferring to make them by hand, for several reasons:

1st. Accuracy in the division of the active principles.

2d. The saving of time and labor, only ten minutes being necessary to make from six to ten suppositories, providing the following mode of procedure is adopted.

The cacao butter is first rubbed to a powder in a cold mortar, adding the active ingredients, and after mixing well, the mortar is passed with contents over a gas or alcohol flame two or three times, according to the temperature, taking great care not to heat too much; after which it may be beaten into a mass sufficiently soft, and rolled on a starched pill machine or tile, to be divided into half as many pieces as the number of suppositories called for. Each piece is then rolled into a double cone with a small spatula, and cut through the center, making two at the same time. With a little dexterity, suppositories may be made to look as well as if moulded, and in much less time.

CUPRI OLEAS.

(Oleate of Copper.)

By S. A. McDONNELL, PH. G.

Having had frequent calls for this preparation, both from other druggists, and for prescriptions in the ordinary way of business, it

seems to me that it might be of interest, and would not come amiss, for me to give an account of the process for preparing the same. No general formula being of ready accessibility, we arrive at one as follows. The reaction being:

$$\underset{159.5}{CuSO_4} + \underset{80}{(NaHO)_2} = Cu(HO)_2 + (Na)_2SO_4$$

159.5 : 1 : : 80 : x = say 2: Therefore, formula being $CuSO^4(H_2O)_5$ = about 36 per cent. of water crystallization. Hence:

℞ Cupri Sulphatis, 2 oz. 5 dr. 40 gr.
Sodii Hydratis Puri, 1 oz.
Aquæ Ferventis, q. : s.
} Equals 2 drs. of the anhydrous salt.

Dissolve the copper salt in a pint of hot water—and it is of importance that the soda salt be dissolved in a large quantity of water, not less than four or five pints for each half ounce of the soda salt used; if any attempt be made of using the latter at all concentrated, the result, on mixing the two solutions, will be to give a blue, then brownish colored, rapidly changing to black, precipitate, which does not fill the bill, and won't make a suitable green-colored oleate. Having dissolved the salts, as directed, when cold, mix the two solutions together (in several five pint bottles, if necessary) shake well, and set aside to settle; pour or draw off the supernatant liquid, and repeat the process until all the sulphate of sodium has been removed—the precipitate should be of a rather nice-looking bluish color: transfer to a wetted filter, and let drain for six or seven hours. Then remove a portion of the wet hydrate, and weigh it; say, take ten grains, and dry it until it ceases to lose weight (avoiding too great an application of heat, so as to not reduce it to an oxide); now, on weighing it again, it may weigh but .5 (= ½ grain), or 5 per cent. Then calculate your proportion according to the following reaction:

$$\underset{97.5}{Cu(HO)_2} + \underset{564}{(HC_{18}H_{33}O_2)_2} = Cu(C_{18}H_{33}O_2)_2 + (H_2O)_2;$$ hence:

564 : 1 : : 97.5 : x = 5.7846 = say, 5 4-5.

But as I deem it preferable to have a slight excess of the copper salt, it would seem best to take, in proportion, but five and a half times as much oleic acid, by weight, as that of (what would represent the dried) the copper salt. Having made your calculation, as above, remove the hydrate, moist as it is, from the filter to an evaporating dish; pour over it the oleic acid, and apply heat,

stirring frequently, until the copper has been all dissolved, or the acid become saturated. Then remove the dish from the fire, and set aside to cool. Any dregs or insoluble portion will settle to the bottom in the water, while the oleate will congeal on the top, and may be removed in an entire cake—being solid, of a waxy like consistence, and having a bright green color. Having removed it from its bed of water, break it (or cut it; it cuts as cheese would) into pieces, remelt it (water bath is now best), stirring briskly, so as to let any water that it may contain evaporate; then pour it, while still warm, into suitable jars; label them Oleate of Copper, and set aside until wanted. When your ℞ comes in calling for 5, 10, 20, or 25 per cent. oleate of copper, remove the required amount from the jar, and mix it, *sec. art.*, with whatever diluent is required; such as oleic acid, simple cerate, lard, or vaseline, etc., which, having been done, you can contemplate with satisfaction, knowing that you have made it yourself.

N. B.—Caustic potash could be used instead of caustic soda—changing the proportion as

$$\frac{(KHO)^2}{112} \text{ is to } \frac{(NaHO)^2}{80}$$

but it takes so long to wash out the resulting sparingly soluble sulphate of potassium, as to make the change not a very desirable one.

QUININÆ OLEAS.

(Oleate of Quinine.)

By S. A. McDONNELL, Ph. G.

The oleate fever is spreading. We have had our first call for Oleate of Quinine a few days ago. Not having it in stock, we had to send out and buy some. However, I resolved to make some, as I believe that a very handsome margin can be gained by the one taking the trouble to do so. Here is the process that I followed, and, I can assure you, that it is in every way a successful one. Take one ounce of Sulphate of Quinine, dissolve it in just enough diluted sulphuric acid to effect a solution; add to this three or four pints of water, in a five pint bottle; then add cautiously,

shaking after each addition, water of ammonia, until the whole faintly smells of Ammonia. Then transfer to a wetted filter, and wash the basic Quinine by frequent additions of water, as rapidly as you conveniently can, until the Sulphate of Ammonium has been washed away, (not using any more water than may be necessary, in order to prevent loss); then allow the Quinine to remain on the filter until the water ceases to drip from it—say, 5, 6 or 7 hours. Then remove a portion of the Quinine from three or four different parts of the filter, so as to strike an average on equal moisture, and of this weigh out, say, ten grains, which place on a piece of tarred bibulous paper, previously deprived of moisture, and dry, until it ceases to lose weight. Of course, it is understood that the basic Quinine should contain $(H_2 O)_3$ in each molecule—$(C_{20} H_{24} N_2 O_2 (H_2 O)_3$, which is not to be disturbed. Having ascertained that the ten grains when dried weigh but, say, two grains net; then 10 – 8 = 2; = 1-5, or 20 per cent., and 80 per cent. moisture. Now, having made your calculation for any required per cent.—say, 25 per cent., then, put 3-5 (of the intended amount of finished product), of the Oleic Acid in an evaporating dish, and to this add the basic Quinine previously removed from the filter (moisture and all), then apply heat (water bath or otherwise) until the Quinine is entirely dissolved—which is very readily done; then remove from the fire. When cool enough, pour into a deep graduate, and let stand a little while; then separate the greater part of the oleate from the watery portion by skimming or decanting, and return to the evaporating dish the watery portion (with some of the oleate), and apply a moderate heat until the water has been entirely driven off; then add the reserved oleate and continue the heat, carefully, until any remaining moisture that it might have contained is driven off; finally, remove from the fire, and add to it enough oleic acid to make up the required weight or per cent.; and it is done.

Oleate of Aconitia is not necessary to keep in stock. When wanted for use, all that is necessary is to weigh out the required amount of the alkaloid, and placing it in the oleic acid, apply heat:—it dissolves very readily—the customer may wait while you are doing it. This will apply to any of the alkaloids (not the salts of the same). Oleate of Zinc is readily prepared; the usual Oxide of Zinc, kept on hand in most every drug store, combines with Oleic Acid by a little attention and some heat. Not so Oleate of Copper, which I shall reserve for a future paper.

FERROUS CHLORIDE.

By S. A. McDONNELL, Ph. G.

Some few physicians in the city are in the habit of prescribing *Protochloride of Iron*, in pill form; it is also used to prepare an Elixir (or Syrup) of the same. As an article of commerce it is not readily procurable, so nothing remains but to make it yourself, and the intervals in using it are so irregular that any attempt (on my part) to preserve the salt intact, from one to another, has generally resulted in failure. It seemed useless to anticipate its use; and to have to prepare it *ab initio* whenever a prescription calling for it is presented, is, to say the least, a great nuisance; and any means by which such a circumstance can be obviated should be hailed with satisfaction. The salt, when recently prepared, is a nice looking one, of an emerald green color, having a formula of $Fe\ Cl_2\ (H_2\ O)_4$; but, in my experience, it soon changes to a dirty, disagreeable, brown looking substance, notwithstanding all care and attention necessary was bestowed upon it. The change being the result of oxidation, it occurred to me, after many failures otherwise to preserve it, that if the salt were kept immersed within a non-oxygen compound it might prove to be the sought-for desideratum. Acting on this idea, resort was had to such of this class as are readily available in most drug stores, to wit, chloroform ($C\ H\ Cl^3$), Benzine ($C_6\ H_6$), Turpentine ($C_{10}\ H_{16}$), all of which answer the purpose very well. To the first one should be given the preference; but, if it contain any alcohol ($C_2\ H_5\ H\ O$), it would be far better to use any of the others. To be brief, proceed as follows. Place your iron, previously washed with a solution of Potash, in the diluted Hydrochloric Acid; set aside for a day or two; heat, strain, and filter; place filtrate over fire, and having added some acid to it, evaporate, and set aside to crystallize; place crystals on muslin strainer, wash with alcohol, drain, and dry well, and immediately place in the non-oxygen compound. When wanted for use, you can smile with content, feeling that the disadvantage to start in with has been successfully overcome. Remove the salt from the liquid preservative, when needed, and simply dry between the folds of a cloth. If necessary to be very particular with it, a gentle heat will remove all traces of the adhering liquid. Of the samples shown herewith, the one in the turpentine shows to the best advantage, being clear, clean

and bright, as when first placed in it, now some six months or more ago.

N. B. To preserve it in good condition, have the salt free from all extraneous moisture before placing it in the preservative liquid.

NOTES FROM THESES

PRESENTED BY THE

GRADUATING CLASSES

OF THE

CALIFORNIA COLLEGE OF PHARMACY,

1883 and 1884.

AGAVE AMERICANA (AMERICAN ALOE).

[BY MORGAN L. JONES.]

The leaves of this interesting plant having been highly praised as a remedy for rheumatism, the writer investigated them for the purpose (chiefly, at least) of finding out to what principle their rubefacient quality is due. A preliminary trial showed that the acridity resides only in the green cortical portion, the fleshy part underneath being almost inert.

The leaves are described as being "lanceolate, and when fully matured six to eight feet in length, ten or twelve inches in width near the base, at which part they are about four inches thick, gradually tapering and becoming less fleshy, and terminating in a sharp spine one inch long. The fleshy part is confined to the central portion of the leaf, the edges being quite thin. Sharp, dark brown spines grow out from the margin at intervals of two or three inches. The green cortical portion, in which the acrid principle is found, is about a quarter of an inch thick, and can be easily peeled off from the white fleshy substance underneath." On removing the epidermis a strong, pungent odor was perceived, and the denuded surface when placed in contact with the skin soon produced intense itching.

The green cortical portion was separated, bruised, and expressed, yielding about fifty per cent. of its weight of a turbid, dark green juice, which possessed the characteristic pungency of the leaf.

This juice was treated successively with chloroform, boiling water, and

cold water. It was also subjected to distillation, as was likewise the crude drug. The following substances were found to be present:

An acrid balsamic substance extracted with chloroform, a yellowish volatile oil, wax, chlorophyll, mucilage, albumen, sugar, tartaric and citric acids.

HYDROBROMIC ACID.

[BY F. ARTHUR BECKETT.]

An elaborate essay is given, with a review and comment upon each of the various processes now used in its preparation.

ANALYSIS OF SULPHURETTED MINERAL WATER FROM PINE CANON.

[BY M. H. DIGNAN.]

A careful analysis has been made, showing the presence of .048 grammes of Hydrogen Sulphide in each liter, and the mineral ingredients such as are usually found, amounting to 13.720 grains per liter.

PIPERIDINE.

[BY EMILE ROTURIER.]

The various methods for obtaining this alkaloid are given; also quite a number of its combinations expressed in equations.

TANNIC ACID.

[BY PAUL REILLY.]

This difficult subject, investigated by some of the ablest chemists, has been reviewed, and some notes added.

ERYTHROXYLON COCA.

[BY H. A. WALL.]

Gives an extended botanical description; also a brief history since the time of its introduction, and a comparison with other plants possessing similar properties. A brief analysis is also appended.

MELALEUCA HYPERICIFOLIA.

[BY J. A. GREEN.]

A good botanical description is given. By analysis the leaves were found to contain one per cent. of volatile oil, the characteristics of which were fully investigated; two resins soluble in ether, possessing different properties; a third resin insoluble in ether, but soluble in alcohol (chlorophyll); tannic acid; a glucoside with properties similar to saponin. The leaves by incineration yield three per cent. of ash, containing carbonates, sulphates, and silicates.

SEMEN BARDANÆ.

[BY R. W. SKINNER.]

A botanical description of the plant is given, accompanied by drawings; also an analysis of the seeds. The following constituents were separated and submitted for examination: Lappin, lappiretin, resin, fatty matter, and fixed oil.

HUMULUS LUPULUS.

[BY C. B. FITZELL.]

An outline of its cultivation is given, with statistical reports; also the result of a brief analysis.

SCHINOS MOLLE.

[BY F. G. LINDSAY.]

Has been fully investigated and described, the author claiming for it properties similar to black pepper, the virtues of which abound in the bark, leaves, and fruit.

BUHACH (PYRETHRUM CINERARIÆFOLIUM.)

[BY B. W. MOORE.]

Gives an analysis of the plant, and some notes with reference to its cultivation in California.

ASSAY OF ORE.

[BY F. S. RIMPAU.]

A short review is given of the method of assaying ores, together with the results of several assays.

VOLUMETRIC TESTS OF ARSENIOUS ACID AND ITS OFFICINAL PREPARATIONS, AND OF COMMERCIAL GLACIAL ACETIC ACID.

[BY J. G. MUNSON.]

A full description is given of Volumetric Processes and Apparatus used.

Summary of tests made on Commercial Glacial Acetic Acid, as found in this market.

	Grams taken.	C. C. required.	Na HO added.	Real $HC_2H_3O_2$ taken.	Per. of real $HC_2H_3O_2$ In samples.
Squibb's	3	48.4	1,93	2.90	96.6
McResson & Robbins	4	52.0	2.08	3.12	78.0
Powers & Weightman	5	64.0	2.56	3.84	76.8
Unknown	10	124.0	4.96	7.44	74.4
Unknown	5	64.0	2.56	3.84	76.8

Having analyzed eleven samples of Arsenious Acid obtained in this market, two were found containing only 92.6 and 92.8 per cent. of pure Arsenious Acid, and the other nine samples were found containing 96.8 to 99.8 of pure Arsenious Acid.

Having analyzed six samples of Liquor Potassii Arsenitis, none were found containing 1 per cent. of As_2O_3 of the required purity; but they contained from .87 to .94 per cent.

Four samples of Liquor Acidi Arsenissi having been analyzed were found containing from .94 to .98 per cent. of the absolute As^2O_3.

EUPHORBIA EREMOCARPUS.

[BY W. B. WHITNEY.]

A full botanical description is given of this indigenous plant. When the powdered drug is snuffed, it produces irritation and violent sneezing, and sometimes causes the nose to bleed. It grows abundantly along the banks of Russian River, in Sonoma County, and in the beds of dried-up creeks. The native Indians use the green weed for the purpose of catching fish in the still pools of streams.

The plant is found to contain Volatile Oil, Oxalic Acid, Tannic Acid, Fat, Chlorophyll, Sugar, and some acrid resins having very much the same properties as Euphorbium.

QUALITATIVE AND QUANTITATIVE TESTS OF DRUGS.

[BY GEORGE W. LOEHR.]

Tests made on three samples of Sulphur Precipitatum obtained in this market. Only one sample was found to be pure, and the other two were

found containing 50 per cent. of Anhydrous Calcium Sulphate. Tests made on three samples of Sodii Bicarbonas, and only one was found containing over 95 per cent. of true Bicarbonate, as required by the Pharmacopœia. Sample No. 1 contained only 90 per cent., and sample No. 2 contained only 94 per cent.

EUPHORBIA PILULIFERA.

[BY CHARLES G. LEVISON.]

This plant is indigenous to the tropics of both the Eastern and Western Hemispheres, and found also in Queensland, Australia. It has acquired a considerable reputation as a specific for asthma, but the author deems its medicinal value in this direction doubtful.

A proximate analysis of the entire plant was made with the following results :

Moisture, 25 per cent.

Constituents Soluble in Ether	15.00
" " " Alcohol	5.75
" " " Water	16.60
" Insoluble	62.65
	100.00

Ash, 20 per cent.

Soluble constitutents consisting of Potassium, Sodium, and Magnesium Phosphate, Sulphates, Chlorides and Carbonates	7.56
Constituents soluble in dilute Hydrochloric Acid, including Calcium Phosphate	3.50
Insoluble residue	9.00
	20.00

CONSTITUENTS SOLUBLE IN ETHER (.725.)

Resin soluble in Ether, Carbon disulphide, and glacial acetic acid	2.50
Waxy Substance	6.00
Chlorophyll	.25
Insoluble Substance	.75
Ash	.50
Volatile Matter	5.00
	15.00

CONSTITUENTS SOLUBLE IN ALCOHOL (.820).

A Resin soluble in 90 per cent. Alcohol, insoluble in Chloroform, Ether, and Benzine	3.00
A Resin soluble in 75 per cent. Alcohol and insoluble as above	2.00
A Resin soluble in 50 per cent. Alcohol and insoluble as above	.50
Ash	.25
	5.75

CONSTITUENTS SOLUBLE IN WATER.

Albumen	2.50
Pectin	1.30
Gum	1.70
A Protein Substance not coagulable by heat	5.80
	11.30
Starch (soluble in boiling water)	5.30
	16.60

APIUM GRAVEOLENS.

(Abstract.)

[BY JOSIE E. BARBAT.]

The author has subjected the entire plant to a chemical investigation with the following results :

One per cent. of the Volatile Oil was obtained from the dry seed, presenting a pale yellow color, and having a sp. gr. of .88. It decomposed Nitric Acid, and with Sulphuric Acid produced an orange red color, which changed rapidly to a brilliant red. Iodine in substance added caused an evolution of dense fumes, the Oil being converted into a resinous mass.

Constituents found in the fresh stems, stalks, leaves and flowers : Water, 85 per cent., Chlorophyll, Volatile Oil, Resins, Sugar, Tannin, Mucilage, and Brown extractive matter.

Constituents determined in fresh root : Water, 90 per cent., Sugar, Resinous matter, Tannin.

Constituents obtained from the dried seed : Volatile Oil, Extractive Matter, Sugar, Oleo-resin, and Mucilage. W.

CHENOPODIUM CALIFORNICUM.

(Abstract.)

[BY THOMAS S. NEWBY.]

This plant, commonly called Soap Root and Jerusalem Pigweed, grows abundantly in Southern California, where it is used considerably by the Mexicans for washing flannels and fine silks, the colors of which it does not affect. The presence of a principle analogous to that contained in Quillaia Bark was, on account of its detergent qualities, suspected; hence the analysis, which resulted as follows :

Moisture, 37 per cent., Ash 11 per cent., Saponin, Resin, Gum. W.

ALPINIA OFFICINARUM (GALANGAL).

(Abstract.)

[BY HENRY B. D. BESTHORN.]

A brief chemical examination of the root corroborates the results of earlier investigators. He resolves the pungent, soft resin of Buchholtz into two resins, one of which is insoluble in Ether. He obtained five per cent. of the Volatile Oil, which boils at 340 deg. Fahrenheit, and has a sp. gr. of .960. Its chemical characters appear to be that of an oxygenated Oil. The addition of Sulphuric and Nitric Acid with heat gives rise to a disengagement of Sulphurous and Nitrous Vapors. W.

ANALYSIS OF WILHOIT MINERAL WATER, FROM OREGON CITY, OREGON.

[BY HENRY A. BALL.]

This water, having obtained some considerable local reputation for indigestion, etc., a quantitative analysis gave the author the following results, calculated to U. S. wine gallon :

Sodium Chloride.....	196	grains.
Calcium Carbonate.....	43	"
Magnesium "	154	"
Ferrous Sulphate	4.06	"
	397.06	grains. W.

AQUA MENTHÆ PIPERITÆ.

(Condensed.)

[BY FREDERICK LOW KRAUSE.]

An experimental review of the several methods proposed, together with additional experiments instituted by the author, has elicited the following:

1. That the use of Calcium Carbonate, Magnesium Carbonate, and Calcium Phosphate, respectively, must be considered objectionable, as the preparation is always contaminated with these substances.

2. The process of the Pharmacopœia, although yielding a fair preparation, is wasteful, and communicates color through some impurity abstracted from cotton.

3. Pulp made from white filtering paper as recommended by the author (30 grains of pulp to 4 minims of Oil), produced a good preparation.

4. By passing aqueous vapor through sponge or through absorbent cotton charged with the oil and condensing the impregnated vapor. The sponge was deemed objectionable, as even after cleansing it by digestion in Hydrochloric Acid, an unpleasant odor was communicated to the water. The absorbent cotton was open to the same objection.

5. Distillation from dried peppermint leaves did not prove satisfactory. Although the distillate possessed the odor of the plant, it had in addition an herbaceous odor, not at all agreeable.

6. The distillation of the Oil with water gave better results, as far as quality was concerned, than the previous methods. Twelve fluid ounces of water and six minims of Oil were carefully distilled to obtain eight fluid ounces.

7. A solution of the Oil in heated water gave doubtful results. To water raised to a temperature of 130 deg. Fahrenheit, the Oil was added with thorough shaking, and filtered when cold. Another quantity of water heated to near the boiling point was treated similarly. The preparation appeared at first all right; the Oil separated after a short time, rising to the surface.

8. Solution of the Oil in water at its maximum density, 39.2 deg. Fahrenheit, gave good results. To water reduced to this temperature the Oil was added and the mixture shaken, resulting into a slightly opalescent, strong preparation, which suffered no separation on acquiring the ordinary temperature, and on boiling it remained unaltered.

The author concludes his paper with the remarks that no perfectly pure medicated water can be made by the use of metallic agencies; that of all mediums that have so far been used to divide the Oil, that of pulp from white filtering paper is to be preferred; that distillation from a mixture of the Oil with water is the best means of obtaining a perfectly pure water, but is not a practical method for the ordinary pharmacist; and, lastly, he would recommend a trial of the cold process, feeling confident of its being superior in many respects to any other method yet advanced, and believes this same method may be applied with success to the preparation of all medicated waters of the U. S. Pharmacopœia where the use of cotton with Oil is directed. W.

RUMEX HYMENOSEPALUS.

(Abstract.)

[BY GEORGE OBERDEENER.]

This plant, belonging to the natural order of Polygonaceæ, is found in sandy soils from El Paso to the Rio Grande, and also in Southern California. It has long been used in Utah and in the lower portions of this State as a substitute for garden rhubarb.

The root of this plant, which has been made the subject of this paper, is fusiform, varying in length from two to six inches, diameter two-fifths to one inch, annulated above, and deep longitudinal wrinkles below. It is nearly odorless, has an astringent taste, and communicates a yellow tinge to the saliva. In small doses it acts as an astringent, in large doses it is a laxative.

The powdered root was subjected to the consecutive action of the following solvents :

Constituents soluble in Ether	.....	30 per cent.
" " " Alcohol	.....	25 "
" " " Cold and Lukewarm Water	.	18 "

The proximate analysis of the root gave the following results :

Organic Constituents : Chrysophanic Acid, Tannic Acid, Resin soluble in Ether, Resin soluble in Alcohol, Albumen, Pectin, Starch.

Inorganic Constituents : Phosphates, Carbonates, Sulphates, and Chlorides of Sodium and Potassium, Phosphates and Carbonates of Magnesium and Calcium.

EUPHORBIA OCELLATA, Dur. and Hilg.

(Abstract.)

[BY ALBERT L. LEBER.]

A small annual plant, growing in the dry valleys of the Pacific Coast Range, from Sacramento to Fort Tejon. It is used by the Indians both internally and externally, as an antidote for the bite of venomous serpents or insects. The stated dose is from 30 to 120 grains in the form of decoction, which is turbid, and possesses the odor and taste of the drug.

Results of the successive steps of the course of analysis :

1.	Fresh plant lost on drying	35.60
2.	Amount of Ash obtained	11.00
3.	Yield to Petroleum Spirit (Fixed Oil)	3.04
4.	" " Ether (Two Resins)	2.82
5.	" " Alcohol (Tannin, Gallo-tannic Acid, and Bitter Extractive)	15.68
6.	" " Water (Glucose, Mucilage, and Pectin)	7.68
7.	" " Sol. in Sodium Hydrate (Pectose, etc.)	.80
8.	Lignin and Loss	23.38
		100.00

W.

QUESTIONS FOR WRITTEN ANSWERS

— AT THE —

ELEVENTH ANNUAL EXAMINATIONS

— OF THE —

CALIFORNIA COLLEGE OF PHARMACY,

1883.

SENIOR EXAMINATION.

Chemistry.

1. Carbon: give its symbol, equivalence, and atomic weight, and the formulæ of its compounds with oxygen.

2. Write the symbols for the following, and indicate their equivalences in the usual manner: Chlorine, Sulphur, Oxygen, Nitrogen, Lead, Calcium, Antimony, Zinc, Platinum, and Silver.

3. Is Sugar a normal constituent of the urine? Give the formula for that Sugar—its action upon polarized light, the products of its fermentation, and a test for its detection.

4. What is Glycerine considered to be from a chemical standpoint; its formula, its physical characters, the condition of one of the commoner animal fats, and a rational formula for one?

5. What is Ozone? Give its formula, how produced, its properties, and a test for its presence.

6. Write a formula for a monobasic acid, a dibasic, and a tribasic. Define the meaning of an Acid, both monobasic and monatomic, and give a rational formula for such an Acid.

7. Give the rational formula for a Haloid Ether, a simple Ether, a compound Ether, an alcohol, a hydride.

8. Give an outline for the preparation of Sulphuric Ether, and express the reaction in symbols.

9. Give an outline for the preparation of Precipitated Sulphur, and show the reaction in symbols.

10. Formulate the preparation of Plumbic Nitrate from Metallic Lead, Red Lead, and Litharge; the preparation of Bismuthous Oxy-Chloride from Metallic Bismuth, and of Argentic Nitrate from Metallic Silver.

W. T. WENZELL,
Professor of Chemistry.

Botany.

1. Fresh plant to be examined.—1. What Class? 2. What Division? 3. What Cohort? 4. What Order? 5. Name another plant of the same order.

2. Cruciferæ.—1. Number of Sepals? 2. Number of Petals? 3. Number of Stamens? Class according to Linnean System?

3. Malvaceæ.—1. Peculiarity of Stamens? 2. Peculiarity of Anthers? 3. Æstivation of Calyx? 4. Æstivation of Corolla? 5. Another order belonging to the Malvales?

4. Inflorescence of Grasses.—1. Name of the bracts that protect the single flower? 2. Name of the bracts that protect the several flowers?

5. Name the parts that form a seed. 1. Which part is frequently wanting? 2. Which part is wanting in the Cohort of Santalales? 3. Name the different parts of the Embryo? 4. Mention a Cohort where the Embryo is defective. 5. State the part that is deficient.

6. To what class of Linne corresponds our class of Compositæ? 1. Name the orders according to Linne's system. 2. Describe the flowers of the Disc and those of the Ray in each order. 3. Give a classification of the Syngenesia according to some natural system.

7. In which division do you classify the Rosaceæ? 2. How do you distinguish between them and the Myrtaceæ? 3. Name an officinal Myrtaceous plant. 4. Name an officinal Rosaceous plant. 5. An order related to Myrtaceæ, and well represented in our flora.

8. How do Algæ and Fungi propagate? Name the different methods.

9. Name a microscopic plant that causes putrefaction on nitrogenous substances. The plant that causes fermentation?

10. What action is that of Chlorophyll under the influence of sunlight?

H. BEHR, M. D.,
Professor of Botany.

Materia Medica.

1. What is Conium? Describe the drug, giving the botanical name and natural order of the plant producing it; also the part used, time of collecting, and any peculiarity of structure by which it can be identified. State also its principal constituents, and give a chemical test by which its presence may be ascertained.

2. What is Gelatine? From what and how prepared? For what purpose is it used in Pharmacy? How can its presence be detected?

3. What plant produces Poke root? Describe the drug as seen in commerce. What are its chief constituents and medical uses?

4. What is Male Fern? Mention its active principle. What precautions are to be observed in the selection of the drug and in dispensing the Oleoresin? Give the dose of the latter, and state what it is used for.

5. Describe the general appearance and internal structure of Podophyllum. Of what does Resina Podophylli consist?

6. Give the name and natural order of the plant which produces Myrrh. Give the characteristics of a specimen of good quality. Which dissolves the larger proportion of its weight—Alcohol or Water?

7. Give the botanical name and natural order of Deadly Nightshade. Name the officinal preparations, specifying those made from the root and leaves respectively, and state the amount of the drug represented in each, also the dose of such as are used internally.

8. What is Cinchona (U. S. P. 1880)? What Cinchona Flava? What Cinchona Rubra? What percentage of alkaloids should each contain? What officinal preparations are made from each? Give a method of assay for total alkaloids.

9. What is Pix Liquida? From what and how obtained? Which of its constituents are used in Pharmacy, and for what purposes?

10. What is Quillaia? What principle does it contain? What gives it pharmaceutical value? What other drugs contain this principle?

W. M. SEARBY,
Professor of Materia Medica.

Pharmacy.

1. a. What is Pharmacy? b. What is the difference between a Pharmacist and a Druggist? c. What is the difference between a Pharmacopœia and a Dispensatory? d. Upon what authority is our United States Pharmacopœia issued? how often is it revised? is its use compulsory by law, or is it one of custom?

2. What do you understand by the following terms? Give an instance or means of an application of each. a. Meniscus. b. Porphyrization. c. Calcination. d. Succussion. e. Desiccation. f. Torrefaction.

3. How would you find the specific gravity of any liquid when the weight of any known bulk of it is given? As an example: a. 16 fluid ounces of a mixture of alcohol and water weigh 6,767 grains at 60 degrees Fahrenheit. What is the specific gravity of the mixture? b. How would you ascertain the weight of a given volume of any liquid, the specific gravity being known? As an example: a. 50 per cent. solution of Phosphoric Acid has the specific gravity of 1.34. Now what would be the weight in grains of one fluid ounce of this acid?

4. What apparatus is necessary to conduct the following Pharmaceutical processes. a. Dialysis. b. Percolation. c. Distillation. d. Comminution. e. Specific Gravity?

5. Give the present officinal process for assaying the morphine strength of Opium. How much should it contain to be officinal, using the Pharmacopœia process for determination?

6. How many kinds of Fermentation are there? Give examples of each.

7. a. What is the strength of Diluted Hydrocyanic Acid, and how is it officinally prepared? b. State also the Pharmacopœial process for preparing the following Preparations: "Antidote for Arsenic," "Diluted Alcohol," "Medicated Waters."

8. a. What three processes are used for the extraction of Volatile Oils? b. Are the larger majority of them lighter or heavier than water? c. What Temperature do most of them boil at? d. How many classes of Volatile Oils are there? Mention some of them.

9. a. What is the strength of the Fluid Extracts? In what respect do they differ from those in the Pharmacopœia of 1870? b. What is the strength of the Abstracts? How are they prepared?

10. ℞. Hyoscyaminæ, Gr. 1-120.
Morphinæ Sulphatis, Gr. 1-5.
Pulv. Altheæ, q. s.
M. ft. Pil. Mitte tales, No. xxx.

Criticize the following prescription :

℞. Tr. Ferri Chlor., dr. i.
Aqua, dr. ss.
Mucilag Acacia ad dr. iv.
M. ft. Mistura.

EDWARD W. RUNYON,
Prof. of Theoretical and Practical Pharmacy.

Committee.

1. Give a full description of the characteristics of the N. O. Ranunculaceæ State under which cohort it is classed. Name the officinal plants of the order and their preparations.

2. Give the officinal process for making Phosphoric Acid, and show the reaction by means of equations. State the per cent. of Orthophosphoric Acid it should contain, and how to detect the presence of Nitric, Phosphorous, and Arsenic Acids.

3. How should you determine the Cl. value of a sample of Chlorinated Lime? Give a process for making Chloroform from Chlorinated Lime and from Chloral. What are the physical and chemical characters and the tests for the purity of Chloroform?

4. What are the characteristics of Iodine? Name at least five of its preparations used in Pharmacy, and the methods of preparing them.

5. What constitutes an Acid? What is the characteristic element in Acids? Define the properties of most Acids.

6. Give the chemical name and formula of Calomel, Black Sulphide of Mercury, Turpeth Mineral, Copperas, Blue Stone, Gypsum, Oyster Shell, Kermes Mineral.

7. Give an outline of processes for Acidimetry and Alkalimetry.

8. How are the officinal compounds of Bi made? Give the equations; also the mode of manufacture of Sulphate of Soda, Chlorate, and Sulphite of Potassium, and Ferric Chloride.

9. Give botanical name, natural order, habitat, and parts used of Kino, Ginger, Buchu, Myrrh, Galls, Matricaria, and Digitalis.

10. How is Fowler's Solution made? dose, antidote? How to separate Quinine from Cinchonine? Process for detection and estimation of Albumen in Urine.

JOHN CALVERT,
E. A. SHRECK,
VALENTINE SCHMIDT,
F. A. GRAZER,
P. C. ROSSI,
F. C. KEIL,
J. H. DAWSON,
Committee on Examination.

JUNIOR EXAMINATION.

1. What are the combining weights of Fe., Hg., Na., Cl., O., Ag., Ca., C., K., Bi, and Au?

2. How are N. H. and Cl. prepared? Give their atomic weights and equivalences.

3. How do you determine the S. G. of Liquids and Solids?

4. Make a table of the weights and measures of the U. S. P. and of the Metric system.

5. Describe the Thermometers of Fahrenheit and Celsius, and give a method for converting the degrees of the one into degrees of the other.

6. When solutions of the following substances are added to Ammonia, what are the results? Sulphate of Quinine, Tersulphate of Iron, Ferrous Sulphate, Argentic Nitrate, Cupric Sulphate.

7. Of what are these preparations compounded: Labarraque's Solution, Lugol's Solution, Donovan's Solution, Fowler's Solution, Goulard's Extract, Griffith's Mixture, Neutral Mixture?

8. What is distillation? What is sublimation? What is maceration? What is percolation?

9. What are Fixed Oils, and in what do they differ from Essential Oils?

10. Mention the officinal *abstracts*. What percentage of the Drug should they represent?

11. Give the officinal process for making solution of Citrate of Magnesia, and an outline of the reactions (without equations).

12. Define the following terms: Root, Corn, Bulb, Stem, Bud, Axil, Frond, Umbel, Fruit, Seed, Carpel, Pistil, Stamen, Calyx, Corolla, Ovary, Pollen, Peltate, Perfoliate, Pinnate, Bipinnate and Imparipinnate.

13. Mention the sources of these medicinal substances: Musk, Cod Liver Oil, Flaxseed Oil, Cacao Butter, Copaiba, Catechu, Ext. Indian Hemp, Balsam of Peru

14. Define the terms Abstract, Infusion, Decoction, Emulsion, Medicated Water, Glyceritum, Confection, Oleate.

15. Give the ingredients and doses of Fluid Extract of Wild Cherry, Tincture of Cannabis, Infusion of Cinchona, Deodorized Tincture of Opium, Tincture of Aconite, Compound Tincture of Gentian, Syrup of Iodide of Iron.

16. Give distinguishing tests for Sulphuric, Nitric, and Muriatic Acids.

17. Finish the following equations: $3\,Ag + 8\,H\,N\,O_3 = Ag\,NO_3 + Na\,Cl =$; $Zn^2 + 4\,H\,Cl =$; $Zn_2 + H_2\,SO^4 + H^2O =$; $Ca\,O + H_2O =$

18. Give tests for the Ferrous and Ferric salts, and for free Iodine, Bromine, and Chlorine.

19. Name the officinal preparations of Opium, and give the average and maximum dose of each of them. From what plant and from which part of the plant is opium derived? What percentage of morphine should opium contain?

20. How is the beverage known as "Soda Water" prepared? Give the Ingredients, and state the changes which occur (without equation)?

JOHN CALVERT,
P. C. ROSSI,
FRED. GRAZER,
J. H. DAWSON,
VALENTINE SCHMIDT,
E. A. SCHRECK,
F. C. KEIL,
Committee on Examination.

QUESTIONS FOR 1884.

SENIOR EXAMINATION.

Chemistry.

1. Define Phenylamine, Palmitin, Para-tartaric Acid, Lævo-tartaric Acid, Inverted Sugar, Glycyrrhetin, Fluorescence, Carbonic Acid, aCrith, Decrepitation.

2. Give the action of Synaptase on Amygdaline C_{20} H^{27} NO^{11} in symbols.

3. Give an outline for the preparation of Citric Acid from lemon juice, formulated in symbols, and the rational formula exhibiting its atomicity and basicity.

4. Give an outline of the preparation of Methyl Chloride, and of M thenyl Chloride, and express the reactions in symbols.

5. Give the formula for Saccharoses, and name three of the most important. Give the formula for Glucoses, and name three of the most important.

6. Give formula and name for one of each hydro-carbon having the general formula of C_n H_{2n}, C_n, $H_{2n}+2$, C_n $H_{2n}+1$, C_n $H^{2n}-1$, and C^n $H^{2n}-6$.

7. Write the graphic formulas for the following: Methyl Carbinol, Normal Butyl Carbinol, Methyl Ethyl Carbinol, Isopropyl Carbinol, Trimethyl Carbinol.

8. Show graphically the constitution of possible isomers of the following: Chloro-benzine, Dinitro-benzine, and Triamido-benzine.

9. Write a formula and name for each for a primary monamine, a secondary, and a tertiary.

10. Explain the five principal modes of fermentation: Alcoholic, Acetous, Lactic, Butyric, and Mucous.

W. T. WENZELL,
Professor of Chemistry.

Botany.

1. How do you classify the Dicotyledons?
   (*a.*) Name the chief divisions.
   (*b.*) Name an officinal plant of each of the divisions.
2. How do you classify the Monocotyledons?
   (*a.*) Name the chief divisions.
   (*b.*) Under which division are the Melanthaceæ?
3. How do you classify the Gymnosperms?
   (*a.*) Name the chief divisions.
   (*b.*) Name an officinal species belonging to the Gymnosperms.
   (*c.*) Name a poisonous species belonging to the Gymnosperms.
4. How do you classify the Cryptograms?
   (*a.*) Which of them possess spiral vessels?
   (*b.*) Which form a regular axis and leaves?

(*c.*) Which form a mere Thallus?

(*d.*) Which possess a regular alteration of generations (Dimorphism)?

(*e.*) Which possess a regular alteration of generations (Dimorphism), without forming a prothallium?

5. Epigynæ:

(*a.*) How do you distinguish the Irideæ from the Amaryllideæ?

(*b.*) How do you distinguish between the Amaryllideæ and the Bromeliaceæ?

6. Apetalæ:

(*a.*) How do you distinguish the Euphorbiaceæ from all other orders of the Apetalæ having a superior ovary?

(*b.*) Name a peculiarity of the Cohort Santalales, in regard to their seeds.

7. Gamopetalæ:

(*a.*) State the difference between the Asclepiadaceæ and the Gentianaceæ in regard to the æstivation of the corolla, and in regard to the position of the anthers.

8. State the distinguishing characteristics between the Myrtales and Rosales.

(*a.*) Position of leaves.

(*b.*) In regard to stipules.

(*c.*) In regard to styles.

(*d.*) The difference between Mimoseæ and Cæsalpineæ.

(*e.*) Name an officinal Cæsalpineæ.

9. Plants containing a fermentable substance possessing properties similar to Pepsin.

(*a.*) Name a plant containing this principle in its sap.

(*b.*) Name a plant secreting this substance on its surface or external organs.

10. State the difference between the Malvales and Guttiferales, in regard to the æstivation of their calyx.

DR. HERMANN BEHR,
Professor of Botany.

Materia Medica.

1. What plants yield officinal senna? Give the commercial names and place of growth of each, and point out their differences. What is the most active constituent? What others are of interest to the pharmacist by reason of their usefulness or otherwise? What is the best solvent of the medicinal virtues of the drug?

2. Veratrum Viride. Give natural order and habitat. By what structural peculiarities can it be distinguished from other rhizomes? What alkaloids does it contain? Give the officinal preparations, with doses of each. What are its medicinal properties?

3. Give the name, natural order, and habitat of the plant that produces cloves. What part of the plant are they? How much per cent. of Volatile Oil do they contain? and what is its composition? How does it compare with the Oils of Pimento, Orange, Bitter Almonds, Mustard, and Wintergreen?

4. Name the officinal Gum-resins, giving approximately the composition of each, and specifying any that contain a sulphurated oil.

5. What plants yield Barbadoes, Socotrine and Cape Aloes, respectively? How are they obtained? Are they all officinal? Give the active principle of each.

6. Name the principal known plants which contain Caffein. What drug contains the largest percentage? For what is Caffein used, and in what doses?

7. What is officinal Male-fern? What particulars should be observed in selecting the drug? What constituents are present in Oleoresina Filicis?

8. How is Sugar of Milk obtained? What other valuable constituents does cow's milk contain, and in what proportion? How are they held together? Why is Sugar of Milk used in pharmacy?

9. In what drugs are the following principles found? State the uses made of each, giving the dose of such as are administered internally.

Pilocarpine,	Carmine,
Codeine,	Physostygmine,
Salicine,	Veratrine,
Menthol,	Piperine,
Gallic Acid,	Narceine.

10. What plant produces Jamaica Sarsaparilla? What Honduras? What Mexican? Make drawing, showing the differences in microscopic structure of mealy and non-mealy Sarsaparillas, giving the commercial names of each.

WM. M. SEARBY,
Professor of Materia Medica.

Pharmacy.

1. (*a.*) In the examination of Vegetable Drugs, what do you understand by Proximate Principles?

(*b.*) Mention some of the preliminary operations, together with a general outline of a practical method by which the proximate principles may be determined.

2. (*a.*) What are the precautions necessary to observe in the keeping and preparing of Reagents and Test Solutions?

(*b.*) If Volumetric Analysis applies only to the quantitative estimation of substances, state the principles involved when substances are analyzed by this method.

(*c.*) What is meant by Normal Solution?
" " " " Semi Normal Solution?
" " " " Deci " "
" " " " Centi " "
Give an example of each.

3. Give the officinal names, unabbreviated, of the following preparations, and state in what respects they differ in *Formula* and *Manipulation* from the Pharmacopœia of 1870.

(*a.*) Fluid Extract Rhubarb.
(*b.*) Goulard's Cerate.
(*c.*) Solution Chloride Iron.
(*d.*) Extract Butternut.
(*e.*) Camphor Water.
(*f.*) Chloroform Liniment.

4. (*a.*) How would you take the Specific Gravity of a powder (Sub Nitrate Bismuth) that is insoluble in water?

(*b.*) How would you perform the same operation with a powder (sugar) that is soluble in water?

(*c.*) Give a definition of Specific Gravity.

5. (*a.*) How is Calomel prepared?

(*b.*) What impurity is it liable to contain which it is important to detect, and how would you detect it?

(*c.*) What officinal preparations does it enter into?

(*d.*) Mercury, as found in the market—does it always comply with the requirements of the Pharmacopœia? If not, mention some of the processes used to purify it.

(*e.*) Into what officinal preparations does it enter in the metallic condition?

6. (*a.*) What is the Specific Gravity of the officinal Acetic Acid?

(*b.*) What percentage of Absolute Acid does it contain, and how would you determine it accurately?

(*c.*) From what source is it obtained, and what is the best means to detect any empyreumatic odor?

(*d.*) How is Glacial Acetic Acid prepared, and in what respects does the Glacial Acid of the market compare with the officinal?

(*e.*) For what pharmaceutical purposes is the diluted Acetic Acid used, and what is the officinal strength of it?

7. (*a.*) What general method is used for the extraction of Alkaloids from Vegetable Drugs?

(*b.*) What is an Alkaloid?

(*c.*) What is a Glucoside?

(*d.*) What Reagents are used for determining their presence qualitatively and quantitatively?

(*e.*) How would you detect in Sulphate of Quinine the cheaper Alkaloids of Cinchona bark?

8. How would you compound a prescription that called for the following ingredients?

Phosphorus, half a grain, Reduced Iron, twenty-five grains, Strychnia, one grain; make into 25 pills.

9. (*a.*) From what source is our Alcohol manufactured?

(*b.*) Give the specific gravity of officinal Alcohol, and what percentage of Ethyl Alcohol it contains by weight.

(*c.*) State the object of the Pharmacopœia in requiring Alcohol to be tested with Solution of Potassa. Will commercial Alcohol stand this test, and what directions are given in using Alcohol for the preparing of Aromatic Spirits of Ammonia?

10. What do you understand by the pharmaceutical terms—

(*a.*) Effloresence; give an example.

(*b.*) Effervescence; " " "

(*c.*) Deliquescence; " " "

EDWARD W. RUNYON,
Professor of Theoretical and Practical Pharmacy.

Committee.

1. (*a.*) What is Bromine? State how it is obtained, giving chemical equation, its Specific Gravity, the impurities likely to exist and how detected. What compounds does it form with metals? Give chemical formulæ of some of them.

(*b.*) What is the result of adding Chlorine, Iodine, or Bromine to an alkaline solution, and heating?

2. Finish the following equation: $KCl\,O_3 + (H\,Cl)_2$ ___ and also show by means of equation how Potassium Chlorate is produced.

3. Under what class of bodies are the hexad alcohols included? What relation does Glucose bear to the hexad alcohols, and what relation does Saccharose bear to Glucose.

4. State the difference between the characteristics of the Liliaceæ and Iridaceæ; also mention the officinal plants in these orders, giving their botanical names and classification.

5. Give the natural order, habitat, botanical name and description of the plant yielding Galbanum, principal constituents; and also give the medical properties of the drug.

6. What per cent. of the extract should be represented in 100 parts of the Tincture of Nux Vomica, and in 100 parts of Tincture of Ignatia?

7. Name the principal pharmaceutical products derived from the Grape. Describe the process of fermentation. Why is crude Tartar deposited?

8. Give Reagents for detecting Silver, Lead, Mercury, in the mercurous form, Arsenic, Zinc, Copper, Calcium, Strontium, Potassium and Sodium.

9. Give the mode of preparing Santonine, and a description of this principle. What is its chemical nature? From what part of the plant is it obtained? State the medical properties and doses.

10. Give the difference between the natural order Marantaceæ and Zingiberaceæ. Name a Marantaceous plant, besides Maranta; also the officinal plants belonging to the natural order Zingiberaceæ.

JOHN CALVERT,
JOHN H. DAWSON,
FREDERICK GRAZER,
Committee.

JUNIOR EXAMINATION.—1884.

1. (*a.*) Mention the different Thermometers in use, and state the boiling and freezing point of Water in each.

(*b.*) A liquid boils at 98.6 deg. Fahrenheit scale. What degree of heat would this be in Celsius? Give the figures and what officinal preparation boils at that point.

2. Write out in figures: Three hundred and fifty Milligrams; Four Centigrams, One Decigram, Nine Milligrams, Five hundred and one Milligrams; then add them together and give their exact equivalent in grains.

3. (*a.*) How many cubic inches in a wine gallon?

(*b.*) How many fluid ounces in an imperial pint?

(*c.*) How many grains in 16 fluid ounces of Distilled Water at 60 deg. Fahrenheit?

(*d.*) How many grains difference between a troy and an avoirdupois ounce?

4. What apparatus are used, and how would you perform the following pharmaceutical operations:

(*a.*) Percolation. (*c.*) Comminution.
(*b.*) Distillation. (*d.*) Elutriation.

State the difference between Decoctions and Infusions.

5. What do you understand by the following terms as applied to stamens: (*a.*) Hypogynous, (*b.*) Epigynous, (*c.*) Perigynous, (*d.*) Epipetalous, (*e.*) Didynamous, (*f.*) Tetredynamous, (*g.*) Monadelphous, (*h.*) Diadelphous, (*i.*) Polyadelphous, (*j.*) Syngenesious, (*k.*) Gynandrous.

6. What is a Syncarp? In the Apricot, which are the parts to which the following terms may be applied: Epicarp, Pericarp, Mesocarp, Sarcocarp, Endocarp, Putamen, Testa, Albumen? What kind of a fruit is the Strawberry?

7. Name the officinal drugs that are yielded by plants in the natural orders Ranunculaceæ and Graminaceæ.

8. Explain the preparation of Carbon Monoxide by the action of Sulphuric Acid upon Oxalic Acid, and give the reaction in symbols.

9. Hydrogen Chloride: Give its formula, its molecular weight, its density referred to hydrogen, its density referred to air, how prepared by synthesis, how prepared by metathesis: sp. gr. of officinal acid, its percentage, strength, and a chemical test for its detection.

10. How many acids of Phosphorus are known? give their formulas and basicities.

11. How many volumes of Chlorine are required to decompose four volumes of Hydrogen Sulphide? Give the reaction in symbols.

12. Write out equation for the reaction which takes place when Zinc Sulphate and Plumbic Acetate are rubbed together.

13. What constitutes a Sulphide; a Sulphite; a Sulphate?

14. Name the physical forms of water, and tell in what they differ from each other.

15. What do you understand by an Element? An Atom? A Molecule? Equivalence? Quantivalence?

16. Write formula for Epsom Salts, Glauber's Salt, Saltpetre, Borax, Lunar Caustic and Potash Alum.

17. Define Gravitation, Cohesion, Adhesion and Chemism. Give an example of each.

18. Work out the following reactions, and give the name of the officinal preparation formed: $Na_2Co_3 + {}_2KH\ C_4H^4O^6$.

19. Name the ingredients of the following preparations, and give doses: Mistura Glycyrrhizæ Composita, Antidotum Arsenici, Tinctura Cinchonæ Composita, Tinctura Gentianæ Composita, Infusum Sennæ Compositum, Acetum Opii, Ceratum Resinæ.

20. What plants yield the following drugs: Opium, Alexandria Senna, Catechu, Cascarilla Bark, Guarana, Quassia, Logwood, Colocynth, Jalap, and Ipecac.

JOHN CALVERT,
JOHN H. DAWSON,
FREDERICK GRAZER,
Committee on Examination.

VALEDICTORY ADDRESS

DELIVERED ON BEHALF OF THE FACULTY OF THE CALIFORNIA COLLEGE OF PHARMACY AT THE GRADUATING EXERCISES, NOVEMBER, 1883.

By Prof. HERMANN H. BEHR, M. D.

Today, for the ninth time, we celebrate the graduating exercises of the Pharmaceutical College, and bestow upon a number of students their diplomas, earned by two years' conscientious study and a rigorous and impartial examination.

The Pharmaceutical Society may justly feel proud, if they compare the beginning of their organization with its present position. This year it possesses a house of its own, a hall where the Society meets, and where the lectures of the College are delivered, and rooms connected with it for the accommodation of the library, the laboratory, and the pharmaceutical and botanical collections. All this has been accomplished without other aid than that bestowed on the Society by some liberal-minded merchants of this city, who foresaw the necessity of having a center of chemical and pharmacognostic learning, as a board of reference and arbitration in complicated questions, and for the protection of their own legitimate commercial interests. With the sole exception of this, for which on this occasion we all tender our heartfelt thanks, the Society has accomplished everything by untiring energy, wise management, and the disinterested and combined efforts of all its members. The progress of the institution has been, step by step, without spasmodic efforts for appearance' sake, or pretension to have accomplished more than was really the case.

There is, of course, still ample room for improvement; the library and collections must become more comprehensive, and the student is not yet afforded the facility of a botanical garden to study and experiment with living officinal plants, instead of the tiresome, and frequently unsatisfactory, examination of dried specimens and drawings. We have had the offer of a piece of ground in Golden Gate Park for this purpose, on the condition that we bear the expense of the necessary improvements. It is probable that the medical colleges which are equally interested with ourselves will contribute their share towards the support of this much needed institution.

It is not only for the facilities offered to the students of medicine and pharmacy that a botanical garden is needed in a new country like our California. We have to settle many questions of practical importance to the inhabitants, who are surrounded by a vegetation of which, at most, only the external characters are well known, but very little of their powers.

In old settled countries, the plants of which are well known, the poisonous are readily distinguished from the innocent, even by those ignorant of botany : but here every one must depend at present upon his own observation and experiment.

In the year 1861 a party camping in the foothills near one of the affluents of the Sacramento River seasoned their soup with a root growing plentifully in the vicinity, and which, according to the statement of the survivors, resembled in taste and external appearance the cultivated parsnep. Shortly after their supper the whole party was seized with dryness of the throat, vomiting, vertigo, and loss of sight, and on the morning of the following day out of a party of seven three were in a dying condition ; the four others, though gradually recovering their sight, were still unable to afford much assistance to their dying comrades.

It is not known what plant caused the deplorable accident ; there are many plants in California which bear a resemblance to the parsnep ; in fact, all the Umbelliferæ do so, more or less. We do not know how many accidents on a minor scale have happened from the poisonous properties of this single plant, which may have been a Conium, a Cicuta, a Sium, Œnanthe, etc. The danger is the greater, in that it proceeds from an unknown enemy, hiding its destructive powers under the semblance of a popular and well-known pot-herb.

As a measure of protection, it is well to look with suspicion upon all umbelliferous plants growing in wet places, and, reversing our ordinary methods of judicial procedure, consider them guilty until proved innocent. In a botanical garden, this and other poisonous plants would be cultivated side by side with the harmless and useful plants resembling them, and all be carefully labelled, so that not only the scientist and student, but the general public, would be able to recognize and remember the differences.

It has been said that California possesses few poisonous plants, and while this is certainly true, the danger of poisoning is all the greater from the general confidence engendered by such reports.

Toadstools are a frequent cause of poisonous accidents, yet very few of them are poisonous; and a large amount of valuable food is wasted for a want of the accurate knowledge of species which would render them safe. Many of the otherwise wholesome species develop their poisonous principle (Amanitine) only under the process of putrefaction, as many other eatables do.

It is desirable, if not essential, that all fungi should be eaten before they ripen their spores ; many are only eatable in the young state. Lycoperdons, or puff-balls, for instance, which, according to the conclusive experiments of our California mycologists, Dr. Harkness and J. P. Moore, are in their early state perfectly harmless and nourishing, later become a dusty mass, and entirely uneatable.

In regard to this class of plants, we ought to imitate the action of other governments, and issue plates in natural colors, one series giving the eatable, the other the noxious fungi.

Rhododendron occidentale has been proven to contain a poison in its root. It is not yet known whether its flowers partake of the peculiarity of those of R. Ponticum, which are known to poison the honey of bees, as the soldiers of Xenophon returning from Persia found by sad experience.

Besides the accidents caused by poisonous plants to man, there are cases of animal poisoning in some parts of California of deplorable frequency. The cause of these accidents is still shrouded in mystery.

Several species of Astragalus, commonly called Loco, or Rattle-weed, have the reputation of causing the death of horses, cows and sheep by slow poisoning. The symptoms as described are those of delirium ending in paralysis. The examination of the specimens sent by farmers and herdsmen has not, however, revealed any dangerous substance; and the attempt to poison animals by mixing the suspected herbs with their food has entirely failed. Nevertheless, the herds in some localities are decimated at certain periods, and it is of great practical importance to ascertain with certainty the agent which works such destruction. This is only possible by raising all such suspected plants in a botanical garden, where they may be examined at different stages of their vital process, and where they may be always had fresh, which is absolutely necessary in cases where the poison is a volatile principle, readily escaping as the plant withers. We know that such is the case with the poisonous species of Crowfoot—and even the opposite fact is illustrated in the case of one of our wild plants, Prunus ilicifolia—where the poisonous principle is latent in the fresh leaf, and developes rapidly during the process of withering. One species of Hosackia, H. Purshiana, which is common near San Francisco, and in fields throughout the central part of the State, has the reputation of poisoning sheep; and in the mountains to which the dairyman of the interior drives his herds during the summer, there grows a larkspur (Delphinium glaucum) in great clumps, six to eight feet high, which causes him many an apprehensive glance. These are only a few of the cases in which knowledge is a treasure, and ignorance is *not* bliss.

The accurate investigation of all such facts is of vital importance, and such investigations, as before stated, can only be carried on by means of a botanical garden; otherwise we must trust to a long series of experiments and be taught by experience, which means a long series of dangerous and fatal accidents. From another point of view, a botanical garden would be very useful to the public. Our California flora has so many characteristic types that Prof. Griesebach, in his wonderful book, "The Vegetation of Earth," has established a separate province for California in the vegetable kingdom. These peculiarities frequently obscure the inherent qualities of plants, and render conclusions from analogies with other floras not only unsafe, but often impossible.

We have many more useful plants than are at present known to the public. Many herbs deserve gathering in their wild state; many deserve cultivation, and many others, so-called weeds, should be protected.

Even our forest trees are very imperfectly known. One of them, Chamæcyparis Lawsoniana, contains a fragrant principle well worth investigating. It was found powerful enough to seriously affect, by mere inhalation, the men employed in the mills where it is cut, until at last experience taught them to provide constant currents of fresh air.

Our agriculturists and horticulturists would be astonished at the treasures to be found by a careful examination of our Flora. They would find simple and efficient remedies against parasitic pests, which they try to destroy at present by complicated and expensive methods. An exact knowledge of the relations between the vegetable and animal kingdoms is the first requisite in their struggle against parasites, either fungoid or insect; and this knowledge can only be obtained by means of a well directed Botanical Garden.

But let the agriculturist fight his own battles. Our chief interest is in those plants that belong, or ought to belong, to the Materia Medica; and here we have another of the peculiarities of the California Flora. With the exception of tropical countries, there is scarcely a region which yields us, in its comparatively unexplored state, so many drugs peculiar to the country, and without analogue in the productions of others. I only mention here Eriodictyon and Grindelia.

The prevailing medicinal products seem to be gum-resins, which principles preponderate, also, in that class of our vegetation which has not yet been the object of pharmaceutical investigation. I refer to the group of Hemizonia and Madia, of which genera several species enjoyed a high reputation among the old Spanish settlers of the country. A less enjoyable reputation is that of *Rhus diversiloba*, the "Poison Oak" of the general public, the "Yedra" of the old Californians.

Notwithstanding its terrible name, however, the plant is more troublesome than poisonous. It acts merely as an irritant to the skin and mucous membranes, in regard to which the receptivity of individuals varies from zero to violent cutaneous eruption attended with fever. Its effects upon the internal mucous membrane seem to vary in the same degree. This is the case with *Rhus Toxicodendron* of the Atlantic States, with *Litræa caustica* of Chile, with Semecarpus of the East Indies, and other plants of the Terebinthaceous family, which all seem to require a certain predisposition or idiosyncrasy. The plant itself may some day prove of technical importance, as its sap is for all practical purposes identical with that of Melanorrhœa, which furnishes the black Japanese varnish.

Next to the gum-resins the Acrid Poisons seem to be best represented in our flora, especially among the Liliaceæ and Melanthaceæ. The different species of Zygadenus, called by the Indians Death Camass, of which one is common in this vicinity, are certainly poisonous, and are more dangerous, as there exists in some part of California a vague notion that they are eatable; an error caused probably by the resemblance of the bulb to that of Camass *(Camassia esculenta)*, which is largely used as food by the Indians.

I have not yet personally known of any dangerous accidents from Liliaceous plants, but remember a case of inflamed and swollen lips in a little girl, who, while binding a garland, held the stem of a flowering Zygadenus in her mouth. My friend, Dr. Kellogg, informs me of a case in which the death of a child was caused by eating the bulb of an unknown Liliaceous plant.

The remaining groups of Narcotics, Diuretics, Diaphoretics, Volatile Oils, etc., will, no doubt, be better represented when more facilities are offered for the study of indigenous plants. At present the Narcotics seem scantily represented, and, as far as known, by plants identical or analogous to those furnishing well-known drugs. We have *Datura, Nicotiana, and Solanum (S. umbellatum)*, which seems to possess properties similar to those of S. Dulcamara. We have also Conium, Cicuta and other Umbelliferous genera, whose species, partly analogous, partly identical to species known to be poisonous in other countries, require careful examination. We have to omit here all those plants the medical qualities of which closely resemble those of similar species of other countries—for instance, the different species of Manzanita, whose qualities are the same as those of the officinal *Arctostaphylos Uva-ursi*, and "Cascara sagrada," the properties of which scarcely differ from those of *Rhamnus cathartica* and *R. frangula*, of Europe.

This enumeration of species possessing medicinal and other powers, is sufficient to show the practical importance of a Botanical Garden, and perseverance in our present quiet but steady progress will, no doubt in time, bring about a consummation so much desired.

We all know and have unfortunately had too many instances of the ruin of learned institutions by the destructive jealousies of scientists. It is the quarrel of the learned which opens the way to the pretender into positions which he dishonors; fortunately for us, our College has never shown symptoms of such discord, but has always been distinguished by harmony and co-operation in the same work.

Teachers and taught have gone hand in hand in perfect harmony with each other and amongst themselves; there has been no envy, but only emulation; and at this moment, looking over the fresh young faces of the graduates, I see not the slighest trace of envy towards the fortunate fellow-student who bore away the prize. You are now leaving College and entering upon your careers. Preserve, I beg of you, that feeling of friendship amongst yourselves, that spirit of youthful emulation, which has cheered our meetings as well in the lecture hall as in field or forest. Continue to look upon each other as fellow students, not as rivals. Recollect not only the teachings of the professor, but the innocent jokes of your companions.

We must all struggle for existence, one more, another less; but when in the battle of life the egotism of age tries to creep on your hearts, remember the days you have spent with your student companions; remember that you once were young.

VALEDICTORY

ON BEHALF OF THE GRADUATING CLASS OF 1883,

By F. ARTHUR BECKETT, Ph. G.

In one of the seaport towns of the Bay State there was a boy who wanted to go to sea. His father and his grandfather had been sailors, and so in the son there was bred in the bone a desire to go down to the sea in ships, which tales of adventure and discovery had fanned into a consuming flame. So it was decided that the boy should go. A ship was found for him, and the day of his departure was set. But somehow or other, as that day approached, his ardor cooled, and his resolution threatened a sudden flight through his finger tips. Surrounding scenes stood out with a vividness that was altogether new. A hundred and one associations laid claim to a regard which he had never before suspected was owing to them. The old homestead whose ample hearth had been consecrated by the incense of his father's pipe, the whitewashed school house, the trim little spire—these all chimed out a melody to which his heart had never before vibrated. The little room, too, beneath the old roof tree, where he had so often sunk to sleep to the lullaby of the pattering rain—each of its many-angled nooks seemed full of a new love and a new peace. He looked upon the sea-girt hills with a different eye. His hand stroked the house dog with a lighter touch. His voice took on a gentler tone when answering the childish questionings of his younger brothers and sisters ; and when he thought (as he often did in these days), when he thought of his mother, in whose hair the steely glint of the Reaper's sickle was just beginning to show, his throat grew big, and his eyes shone with a new and strange emotion. He would have delayed his going, but that time and tide, which wait for no man, could hardly wait for him. Steadily the time drew near, each day marked by some token of loving care added to his sailor-boy's kit. Now a homely shirt or pair of woolen socks, again a knitted scarf to keep him warm ; now a jacket or a belt, again the Good Book—a compass to guide him through rocks and shoals more treacherous than any earthly—*each and all tokens of watchful and devoted love.* At last a day dawns which will ever live in his memory. The time has come to say good-bye. He cannot say it. All the memories of his boyhood crowding fast together conspire to choke his utterance. Words are too feeble to express what is welling within him; and he wrenches himself away with a great sob, and gropes his way down the path to the gate through a mist of blinding tears. And so it has *ever been*

and so it will *ever be.* Some one has said with great truth that "life is made up of partings." And it is no less true that, despite the teachings of experience, few of us ever learn to say good-bye. It is a trial, and the many would rather escape than endure it. Yet there are times when good-bye must be said. Custom has decreed that an occasion like the present should be one of them, and my *classmates* have chosen that the words should come from my lips. To you, ladies and gentlemen, my task is *not* a *duty* but a *pleasure.* For *you* share only words of welcome, words of thanks for that encouragement of which your *presence* here to-night is at once the earnest and the emphasis. *Appreciation* and *encouragement* of *effort* are the spurs which will goad it on to ultimate triumph. There is no *man* or *woman* in *any* station of life, however lowly, however lofty, who is not bettered and quickened by kindly and just appreciation; and there are few, if any, who stand in greater need of or hold greater claim upon such appreciation than the *Pharmacist;* and this from the character and the responsibility of his work. It is preëminently a work of *self-denial,* for you may find the apothecary at his post from early morning till late at night; always ready to bear his part, not only in the alleviating of pain and suffering, but with a ready heart and quick hand towards the needy and the destitute.

In nearly every other calling there are certain stated times when the jaded brain may say to the weary body, "Rest awhile, your work is done." But the Pharmacist's vocabulary includes no such welcome combination of words. *His* work is never done, not even after the hours of toil from early morn till midnight; for should he then deceive himself and lie down to dream of sleep, he is soon rudely aroused to a sense of his responsibility by the tinkle of a bell above his head. I have little doubt that Edgar Allen Poe would have dedicated a stanza of "The Bells" to the Pharmacist, had the profession been held in greater repute in his day. Times have changed, however, since his brain chimed out the changes of that melodious discord. Of late years Pharmacy has been fitted with seven-leagued boots, and has advanced with gigantic strides to the high position which she holds to-day. And that she does hold this vantage ground is due absolutely and entirely to the untiring energy and unswerving devotion of individual laborers within her ranks—and to *none* more than to *you,* the *learned* and *honored Faculty* of our own College of Pharmacy, whose self-sacrificing work, in the face of almost insurmountable obstacles, has now laid at your feet the first fruits of a harvest that promises greater things than ever of old. I know well that for years your patient labors reaped no compensation as the world counts compensation. But I also know that your work —a work of *humanity*—will *live* when the shadows shall deepen round you, and your day of toil sinks into the restful eventide. And when that time comes (and the question of bread and butter sinks into insignificance), such compensation as this becomes the best and highest of all, because it can never be *bought,* but only freely given. And at this point it is that I would,

like the sailor boy, go and leave the words of parting all unsaid. I, and those for whom I speak, feel that words are powerless to express the memories and the thoughts that fill our minds as we sit here to-night at your feet for the last time. For two years we have longed to adventure our bark upon the sea of fortune. You have fostered that longing, and have from your wealth of learning supplied our wants, and equipped us for the voyage. And now, when we remember all your kindness, all your patience, and the many pleasant hours spent beneath the sunshine of your counsel and encouragement, whether in the field or the classroom, it is hard, Gentlemen of the Faculty, to say good-bye.

The position of a Professor is fraught with great and manifold responsibility. To him is vouchsafed the great privilege of impressing upon his pupils the type of his own individuality.

Gentlemen of the Faculty, the *best* thanks that I can offer you is the hope that *we may*, if not all, then *some* at least, carry away with us some faint type and image of yourselves ; and in that hope, I bid you *all* Good-bye.

Your labors have been great and arduous ; so great, indeed, that without some other help they had been well nigh too heavy to be borne. "Give me a fulcrum, and I will move the world," cried Archimedes. Gentlemen of the Faculty, *you* have, it is true, been the moving power, the lever, which has set in motion the College of Pharmacy, as we now have it.

But without a fulcrum, your work would have been immeasurably increased. That fulcrum has not been wanting; that is to be found in that honorable body who are among you tonight—the President and Trustees of the College. And to them we offer our sincerest thanks.

Gentlemen of the Class of '83, at last the day has arrived for which we have been anxiously waiting. As pharmaceutical students, we have not been permitted to form those intimate ties of friendship which characterize students in a classical or theological school ; the time allowed to us for our studies, and the circumstances which have surrounded us, not *admitting* of it. *We* have had no time for "Greek Letter Societies," no time for muscular education, save, perhaps, at the mortar and pestle (or an occasional convulsive attempt at perpetrating the giant swing on the bar of one interested in our welfare). I would impress upon you the fact that our parting here to-night is not to be a parting from our Alma Mater, but rather a bond of sympathy, which, annihilating time and space, will ever link us to her, and turn our every thought towards her advancement. So (as the boy at sea), by bearing in mind the teachings we have received of her, and by steering the course which she has laid down for us, we will go onward in the realms of science, not only as the old Latin adage hath it, "even *unto* the stars," but beyond them. *One most* important point we must ever keep in view is, that the success of our institution depends upon our endeavors to further and strengthen our Alumni Association, and by that means to uphold and advance the standing of our College.

The life of the College depends, in a measure, upon the interest displayed

by her graduates. Her present founders cannot be always with us; therefore we must be ready to come forward with our support when called upon; and should necessity demand it, let us always show the interest we feel in our College, by offering our hearty support towards sustaining the Trustees and Faculty in whatever they consider advisable for her welfare and advancement. The Alumni, while it depends upon each and every graduate, and each and every class, yet specially requires the entire support of this present class. And now I close, and, wishing you every success through life, I leave you, in the hope that our devotion to the interests of our Alumni Association will be the means of bringing us all together at the close of another year.

Classmates, Good-bye.

ADDRESS

DELIVERED TO THE GRADUATES OF THE CALIFORNIA COLLEGE OF PHARMACY, METROPOLITAN HALL, NOV. 13, 1884,

BY SAMUEL P. SPRECHER, D. D.

At the last commencement of the College of Pharmacy, I was announced to speak on the subject of the Scientific Spirit. Being providentially prevented on that occasion, the Committee has asked me to deliver tonight the speech I had intended to deliver then.

The speech that is kept a whole year is apt to spoil, and yet, I do not believe I could think of anything upon which I would rather talk than that subject, or one that would be more fitting upon such an occasion as this.

If you will give me your attention for a little time, I want to call your attention to certain characteristics of the true Scientific Spirit. By the Scientific Spirit I mean the spirit of investigation, the spirit that searches after the principles of things, that searches for the laws which govern the phenomena of nature ; the spirit which proves everything, and which analyzes everything, and will know the very nature of everything that lies within the range of human investigation ; the spirit which hungers and thirsts for knowledge ; the spirit that is willing to endure any amount of labor and of sacrifice in order to add to the stock of human knowledge and to discover some truth or some fact which will be for the good of mankind, which will save life or health, or enhance the happiness of man.

There is nothing in human nature that is more sublime, than some of the exhibitions of this scientific spirit. Some years ago, when the great plague was raging in Paris, a celebrated physician, knowing that his own life would be the almost certain sacrifice, performed a dissection upon the body of one of the victims of the plague. He died almost immediately after the operation ; he was found after death, and at his side, in disinfecting vinegar, was the record of his experiment, of his discoveries ; he had put them in disinfecting vinegar, so that no one might be in danger of taking the infection.

Is there not something wonderfully sublime about the spirit of a man like that ! Think of a man taking his life into his hands in order to attain a fact, yet undiscovered, which may be of vast importance to mankind, which may save thousands of lives, and taking that life of his into his hands, says : " I give this life for that fact." Nothing can be more sublime than

that. The late Dr. Geo. M. Beard, one of the most celebrated physicians that America ever produced, when lying on his death-bed, thought his symptoms peculiar in some respects, and with "the ruling passion strong in death," though he was suffering excruciating agonies, carefully noted down, as the disease went on and death approached, his own observations upon his symptoms, and died in the very act of giving to man some new truth. The search for truth, under such circumstances, in the very face of death, in the midst of suffering, is wonderfully sublime. If a man has made it all right with his soul, as he had, I think there is something wonderfully sublime about a spirit like that.

A love of discovery, a desire to communicate to others the very last thing that he can discover for the good of the human race; that is what I mean by the true scientific spirit. This spirit is the end of all education. The primal object and the greatest achievement of any school of science, is to infuse into the minds of pupils that spirit, that love of knowledge, that craving for truth. Let any pupil have that, and knowledge is only a question of time—it is bound to come. Proficiency in his profession is only a question of time.

Without that spirit, all the formulas and terms that may be crammed into the student's mind in the College course are of no account whatever —they are very soon forgotten. Therefore, the best school is the school that infuses that spirit; and the best teacher is the teacher who can infuse his own enthusiasm, and he is not fit to be a teacher unless he is enthusiastic.

I know a Professor who changed the whole character of an institution by his own enthusiasm and devotion to the natural sciences; and so is it with pupils, with graduates of any college or of any scientific school; they must have enthusiasm, and the presence or absence of it will determine their after-life and career. The presence or absence of it will mark the difference between them.

There is a very great difference between men in all professions. Go through San Francisco, into all of the drug stores, and you will find two classes of men: you will find some who are merely dealers in drugs, who merely sell to make money; it is merely a business with them.

There are others who are true Pharmacists; they are scientific, they are always investigating, searching out the nature of the things with which they deal, and knowing the why and wherefore of their operation.

I know a Pharmacist in New York, who is an almost perfect example of the "scientific spirit" in his profession. He is a practical salesman, and yet every spare moment that he has at his disposal is employed in the study of the nature of drugs, in studying roots, and herbs, and fluid extracts, and tinctures. That man is not content to see a bottle on his shelves, when he does not know the nature of its contents; he is an intelligent Pharmacist; he is no mere druggist; he is a scientist, he is a student, he is all the while collecting knowledge, and carefully noting and arranging it.

Well, my friends, this is the nature of the scientific spirit; and I have a particular object tonight—you may call it a selfish one if you please—but I want to call your attention now to the fact that this scientific spirit is always very modest about its pretensions and professions. It does not claim anything that is not warranted.

Do you not observe that one of the most unfortunate tendencies of scientific people in our day (and we are all becoming scientific—every schoolboy is a scientist now, and all the trades and employments are becoming scientific, even down to farming, which is done on a scientific principle; everybody is talking science, and everybody is reading science)—well, now, I want to say that one of the most unfortunate errors of the times is pretension to that which is not warranted.

It is unfortunate, because it is contrary to the true scientific spirit, which always recognizes the limitations of its discoveries, the littleness of them, and the limited range within which it can operate; the mysteries which it has not found out, as well as those which it has. It recognizes the mysteries that stand all around about us in nature, which we meet before going very far in our observations These mysteries, which leave such a vast field of uncertainty, are always recognized by the true scientist.

You will always find him a modest man. Sir Isaac Newton, after he had made the grandest of his discoveries, said that he felt like a school-boy on the shore of the sea, picking up a few pebbles. What was his knowledge, compared with the vast ocean of knowledge which lay before him?

And so, I say, let us in all of our scientific studies and professions be modest, and not assert that which we are not warranted in asserting.

And then next, and lastly, the true scientific spirit is non-partisan. It never tries to use truth for partisan purposes, and to use supposed discoveries in that direction. It is not for that purpose that the true scientist searches after truth.

To use truth for partisan purposes, to use truth of science as a club to wound others, or in the interest of certain beliefs, or against somebody else's belief, is not a true scientific spirit.

I will tell you of a man who is the most perfect illustration I think I ever met of the true scientific spirit. He is eminent in science, and just as eminent as a Christian. He holds views in science which some think conflict with the Bible.

I asked him once, "How is it that you believe in the Bible, and yet hold such opinions?" "Why," said he, "I never knew that my science had anything to do with my religion, none whatever. I never thought of the Bible; never thought whether it agreed with my science or not; it does not concern me to know.

"I am now investigating; I do not pretend to think myself at the acme of all truth. I pursue my investigations without thinking whether they are opposed to religion or to the Bible, and I never use them as a club against my own beliefs, or the beliefs of anybody else." That is the true scien-

tific spirit: it pursues the investigation of nature without any attempt to use its discoveries for partisan purposes. For what do we yet know, my friends, of what the scope and form of the final truth will be? There is more to be discovered than is discovered, and the issue of that discovery is not known to you or to me.

Finally, the true scientific spirit is the love of truth for its own sake, without any other interest either for money, for fame, or for any selfish use of it. It is love of truth, love of the facts, the enjoyment that comes from the discovery of the facts.

It is an important point in any man's life, when that spirit is born in him; it is like the birth of first love, and I don't know which is the more intense of the two; but it is a most interesting crisis, when the love of knowledge is born in a man; when the perception of some grand or beautiful birth of science kindles his eye, and flushes his cheek, with a sense of possession more joy-giving than all wealth can bestow—when that experience comes,—he is a new man.

VALEDICTORY

ON BEHALF OF THE FACULTY, AT THE GRADUATING EXERCISES, NOV., 1884,

By Prof. W. M. SEARBY.

Ladies and Gentlemen of the Graduating Class:

When a fond mother, who has lovingly watched the growing powers of her child, carefully noting each little increment of strength, and courage, and self-reliance, finds that she can safely trust him to go alone, without even so much as holding on to her apron-strings, mingled feelings of pride, relief, and regret fill her soul, as she looks down upon her offspring; *pride*, that her own is so brave a boy, and is doing so nobly; *relief*, that much tedious, painstaking work is over; and *regret*, that the joy of seeing that one overcome his first difficulties, and achieve his first triumphs will never occur again. Some such feelings as these are uppermost in the hearts of the Faculty of this College on Commencement night; and I am here to give expression to them, and to bid you God speed as you leave us to go your way through life, needing no longer, we trust, to lean upon tutors, but able to pursue your investigations—for the true pharmacist is always investigating—without any aid or direction from us. At such a time as this, congratulations are in order, and so it would be almost common-place to offer them. Yet, as I call to mind the difficulties under which most of you have labored—some from early disadvantages, others from long hours of work, even while you have been attending college; when I recall the great advances you have made, and the uniformly satisfactory examinations you have passed, it is but due that I should say we are proud of you! You have done well, and our efforts on your behalf are well repaid in the general proficiency of the graduating class. And, in particular, I take great pleasure in informing the audience, who have assembled to do honor to this occasion, that one student has won for herself a noteworthy success—I refer to the first lady graduate of this College. Born and educated in this city, never having set foot outside of this commonwealth, she is a California girl, through and through, and no other State can claim in her any of the credit which is hers by virtue of her intelligence, perseverance, and grit. She has demonstrated what some others have believed—that a lady can be a pharmacist. In the department of practical pharmacy, in which it might have been expected that she would have been deficient, her examination showed more than average skill and expertness of manipulation;

while in theoretical chemistry, that is so formidable to most students, and, at first, seems almost incomprehensible to ladies, she did remarkably well.

Although this is the first time that the California College of Pharmacy has conferred the degree upon a lady, this has been done before by other colleges. In 1863, the New York College of Pharmacy conferred the degree of Graduate in Pharmacy upon Miss Mary Putnam (now Mrs. Mary Putnam Jacobi, M.D.), and last March the same institution honored two other ladies in the same way. I think ladies have also graduated from the Colleges of Pharmacy of Philadelphia and Chicago. It seems, therefore, that the right of women to make pills, as well as to take them, is being generally recognized; and when once the public have become accustomed to seeing ladies as well as gentlemen in our pharmacies, I know of no valid reason why room should not be made for them there. The difficulties will be mainly in the transition period. It is not every apothecary who can afford to risk injuring his business by introducing a fashion which, if not startling, would be, in most cases, very unexpected. Yet, I should not be surprised to see such a change brought about in course of time, to a limited extent, notwithstauding the opposition of conservative pharmacists.

But the proprietor of the pharmacy is not the only person who would run serious risks in attempting this innovation. The lady, herself, takes desperate chances, as will be seen from the history of a young woman, who, some years since, entered a drug store, and became a student of this college. She made most excellent progress the first year, and early in the second year the Faculty began to speculate on her chances for carrying off the gold medal. But, alas! for the uncertainty of all human expectations!

> "The best laid schemes of mice an' men
> Gang oft agley."

All at once, we missed her from the lectures. Her bright eyes looked into ours no longer. She did not win the gold medal, but was won herself; for when trade was dull, Cupid was busy, and soon she became the prize, more precious than gold, of the head clerk in the establishment in which both were employed, and is to-day the wife of an enterprising Graduate in Pharmacy in one of our interior towns. Thus this College lost a most promising student, while he gained a help-meet; and, now, "the heart of her husband doth safely trust in her — she will do him good and not evil all the days of her life."

I mention this case as a warning to all young ladies who aspire to make pharmacy their vocation. It is a dangerous business!

Members of the Graduating Class, as you go forth to your respective fields of duty, I desire to say a few words touching the relations you will sustain to this College and to the community. Most of the points I should like to dwell upon are embraced in our CODE OF ETHICS, a copy of which I take pleasure in presenting to each of you.

* * * * * * * *

You will observe that the principle underlying this Code is the golden rule: "As ye would that others should do to you, do ye even so to them." If you earnestly endeavor to carry out this rule in all the transactions of life, whether they affect your brother pharmacists, or the members of the medical profession, or the public, you will not feel that this Code imposes any restraint upon your method of doing business. And if you meet every question that may arise between yourselves and other pharmacists with whom you may be brought into competion in the spirit of this rule, you will not often find it difficult to determine the line of duty.

In all probability, you will soon be engaged in business on your own account. In harmony with this Code, you will then seek to advance the interests of Pharmacy, and particularly to promote pharmaceutical education by every means in your power. You will also strive to promote the welfare of those, who, like yourselves, are engaged in this occupation, whether they be employers or employed.

The profession of Pharmacy at the present time is, for the most part, conducted by persons who are largely engaged in trade. To a great extent, they are dependent upon this trade for their maintenance. This brings them into competition with other traders and with each other, to such an extent that they cannot afford to ignore business principles and business methods in following their calling. In any efforts at reform, therefore, in the manner of carrying on this business, prudence and moderation are necessary, if you would be successful in your efforts. Nevertheless, there are some evils, which, it seems to me, might be remedied, in part, at least; and I ask your consideration of one or two of them, in the belief that so far as your influence may be exerted, it will always be on the side of reform.

The first I would mention is this: that you lose no opportunity of cooperating with your fellow-pharmacists in any well directed efforts to *shorten the hours of labor* in drug stores. The majority of druggists in this city keep their stores open for business sixteen hours a day, for seven days a week. In my judgment, this is simple nonsense. The public are not benefited by it, the druggist makes no money by it, and the unhappy drug clerk is the victim of a useless and profitless custom. The proprietor who stays in his store sixteen hours a day, because he does not know how else to spend his time, needs no sympathy, and is unworthy of it if he thinks he needs it; and the one who keeps open his place of business for two or three hours after any necessity for doing so exists, for the sake of a few extra dimes, when by so doing he must keep his employés from needed rest and recreation, is not much better. It is my firm belief that if the drug stores of this city were to be closed at nine o'clock instead of *eleven*, the proprietors would be the gainers financially, while the assistants would have more time for necessary respite from the demands of business, and for improving their minds. Members of the Graduating Class, what a boon those two hours a day would have been to you during the last four years, if you could have had them! Then, again, the custom of keeping drug stores open all day on

Sunday, I believe, is not a good one. They might be closed without injury to any body for several hours—say from 10 A. M. to 5 P. M. At first, some inconvenience would result; but if the practice were universal, people would soon become accustomed to it, and get their needful things beforehand, or wait until the honor for re-opening arrived.

Surely, there is room for some reform in these things. We are now requiring of young men learning the drug business that they devote a great deal of time to study, and it is with much difficulty that many of them can find the time, and when they do, they are often worn out with over-work, and not fit to study to advantage. I was informed today, by some of his fellow-students, that the gentleman who has been awarded the second prize to-night, rarely got time for study before 9 P. M., and that he then studied until all hours in the morning. Ladies and gentlemen, this is too much to expect of any young man. Having experienced this hardship yourselves, I trust you will always be foremost in any effort that may be made in this direction.

The only other matter to which there is time for me now to ask your attention, is one which I approach with much diffidence, knowing from experience the difficulties that surround it. I refer to the manner of selling alcoholic beverages in drug stores. I am jealous of the good name of our profession, and spurn with indignation the imputations that are sometimes cast upon us by reckless persons, because of the unworthy practices of a few individuals. It must, however, be admitted that there are some—I hope only a very few—who do dispense liquid refreshment in a most appetizing way over their counters, and who use the Soda Fountain as a convenient instrument for mixing drinks. I judge that there is a wide-spread belief that this is the case, from the surprise and indignation which have been shown to myself when I have refused to sell Soda Water with "Tomato Syrup" or "a stick in it." I do hope it is only necessary to call attention to this abuse of a remunerative part of our business, to secure its correction. A loose way of selling liquor is detrimental to the clerks and apprentices in our stores, injurious to the public, and degrading to our profession. While it seems necessary that druggists should keep for sale wines and liquors for medicinal purposes, any tendency towards converting our pharmacies into liquor stores should be carefully guarded against, and frowned down.

Members of the Graduating Class, I trust that in the matters to which I have referred, and all others that may come under your notice in connection with your daily routine, you will always be guided by a desire to do that which is high-minded and pure; that you will always do your part towards raising the standard of qualification among pharamacists, and side by side with that, the moral tone of those engaged in this honorable calling, so that your very presence in it shall be at once a stimulus to scientific improvement and business probity.

VALEDICTORY.

DELIVERED ON BEHALF OF THE GRADUATING CLASS OF THE COLLEGE OF PHARMACY, AT THE COMMENCEMENT EXERCISES, IN NOVEMBER, 1884.

By H. A. BALL, Ph. G.

Mr. President, Ladies and Gentlemen:

The interest shown by the residents of this city in our progress is something of which we are justly proud; for the high rank we have attained among Pharmaceutical Colleges is greatly due to the hearty encouragement and support given us by the citizens of San Francisco. Your presence here this evening cannot but be a flattering testimonial to our College and ourselves: by honesty of purpose, perseverance in labor, uprightness in our dealings with our fellow-men, we hope to prove that your confidence is not misplaced. Believe me, we are truly grateful for the marked attention shown us, and wish we could express our thanks more materially than by words. To those of my classmates who reside in your beautiful city, to-night will not be a farewell; but we who go, perhaps not to return, take this opportunity to say good bye. We all thank you, and ask for your best wishes.

HONORED PROFESSORS:

You have done so much for our welfare that I am at a loss for words to express our gratitude. You have by patient toil enabled us to reach a period in life for which we have wished for years, that of graduation; you have laid the corner stone of knowledge in our minds, knowing that upon so sure a foundation a structure worthy of your teachings could be raised. We only ask time to enable us to show that the sacrifices you have made for us were not in vain.

PROFESSOR SEARBY:

Formal words cannot convey the extent of our deep obligation to you, for you have not only taught us "Materia Medica," but have given us many lessons that will influence our future lives.

You have given us, gratis, knowledge which could only have been gained by long contact with the world.

By the interest you have taken in our class, by the perseverance with which you have pressed the details of study upon our minds, and by your

cordial voice and genial smile, you have encouraged and aided us in pursuit of knowledge. In behalf of the Class, who will always retain you in memory, I thank you.

PROFESSOR RUNYON :

You have taken us from the time when Archimedes discovered specific gravity to the present day, when discoveries and inventions no longer surprise or astonish us. By your careful explanations you have shown us how we may rise above the man who sells only for gain ; you have poured unreservedly into our laps the fruits of years of experience and study, that we might become PHARMACISTS in the full sense of the word. In parting from you, our regret is softened by the knowledge that when new faces take the place of ours, you will still keep in kind remembrance the " Class of '84."

PROFESSOR WENZELL : .

Chemistry, by the progress of the last fifty years, has become so abstruse a science, that without your practical demonstrations and ceaseless care, our present comprehension of this study could not have been reached. To you, the knowledge of having imparted so many of nature's secrets to us is no doubt sufficient recompense ; still we will always cherish pleasant recollections of your kindly face and voice, as you explained some complicated and difficult chemical calculation. We will not only remember you as a teacher and friend, but as one whose opinions and discoveries place him in the front rank of the chemists and pharmacists of the present day.

DR. BEHR :

You have made our stay so pleasant that it is hard to realize the end. It does not seem possible that after to-night many of us will see you no more ; but always the thought of you will rise in our minds surrounded by the scenes we have visited together ; of Sunnyside, Crystal Springs, and other places, each with some circumstance to fix it indelibly on our memories.

What do we not owe to you, whose extensive learning opened the book of nature and filled the pages which had before been blank to us, and taught us that man does not alone commune with nature, but with Him who made all things, both great and small ! As a teacher, we admire you, as a man we respect you, and ask your friendship as a boon to be cherished through all future time.

CLASSMATES :

Through two years we have studied together, not knowing how closely our companionship had joined us until the time of separation brings the knowledge upon us all. Many acts of friendship, many trifling deeds of

kindness, many kind and encouraging words, have so strongly welded the chain which binds us, that now it cannot be broken without saddening all our hearts. But long farewells only increase the pain of parting.

Let me briefly say, that I wish you all the best of this world's goods, and hope you will always be surrounded by kind and loving friends. If differences have existed between us let them be buried in the past, that in the future our memories of each other may not be tinged with the shadow of regret, save that our days as classmates and companions are past and gone.

Gentlemen, may you all reflect credit on your Alma Mater.

ALPHABETICAL LIST OF THE COLLEGES OF PHARMACY

IN THE UNITED STATES,

Whose diplomas are granted only when the student possesses, in addition to the theoretical or scientific knowledge acquired by study, a practical knowledge of the apothecary business, obtained by actual experience for several years previous to examination.

ALBANY COLLEGE OF PHARMACY.....Albany, N. Y.
CALIFORNIA COLLEGE OF PHARMACY.....San Francisco, Cal.
CHICAGO COLLEGE OF PHARMACY.....Chicago, Ills.
CINCINNATI COLLEGE OF PHARMACY.....Cincinnati, O
LOUISVILLE COLLEGE OF PHARMACY.....Louisville, Ky.
MARYLAND COLLEGE OF PHARMACY.....Baltimore, Md.
MASSACHUSETTS COLLEGE OF PHARMACY.....Boston, Mass.
NEW YORK COLLEGE OF PHARMACY.....New York, N. Y.
PHILADELPHIA COLLEGE OF PHARMACY.....Philadelphia, Pa.
PITTSBURG COLLEGE OF PHARMACY.....Pittsburg, Pa.
ST. LOUIS COLLEGE OF PHARMACY.....St. Louis, Mo.

GRADUATING CLASS, 1884.

JOSEPHINE E. BARBAT,
HENRY A. BALL,
HENRY E. D. BESTHORN,
WILLIAM H. DICK,
FREDERIC L. KRAUSE,
ALBERT L. LEBER,
CHARLES G. LEVISON,
GEORGE W. LOEHR,
JAMES G. MUNSON,
THOMAS S. NEWBY,
GEORGE OBERDEENER,
ANDREW D. WALSH,
WILLIAM B. WHITNEY.

GEORGE OBERDEENER received the First Prize of a Gold Medal.

ALBERT L. LEBER received the Second Prize, Roscoe & Schorlemmer's Chemistry, 5 vols.

CHARLES J. SCHMELZ, of the Junior Class, was awarded tickets to the Senior Course of Lectures, for passing the most satisfactory examination in all the branches.

GRADUATES.

Name.	Date of Graduation.	Thesis.
Adair, Wm. H.	1881	Extract of Malt.
Argenti, J. J. B.	1881	The Olive and its Product.
Bacon, Gaston E.	1875	Analysis of Tincture of Opium.
Barbat, Josephine E.	1884	Apium Graveolens.
Barbat, J. H.	1880	Taraxacum Leaves and Root.
Bauer, Fred C.	1877	Analysis of Well Water.
Ball, Henry A.	1884	Analysis of Wilhoit Mineral Water.
Ball, Robert L.	1882	Bitter Bark from San Salvador.
Beckett, F. Arthur	1883	Hydrobromic Acid.
*Besthorn, H. E. D.	1884	Alpinia Officinarum.
Burnett, G. G.	1879	Rhamnus Purshiana.
Barrington, Chas. L	1882	Vitis Vinifera.
Chard, Geo. R	1881	Iodoform.
Cody, Nelson A.	1881	Croton Procumbens.
Curragh, John M.	1877	Damiana.
Calegaris, Joseph	1882	Punica Granatum.
Devine, John	1877	Seidlitz Powders.
DeWitt, James M.	1881	Pharmaceutical Ethics.
Dick, William H.	1884	Chamæcyparis Lawsoniana.
Dignan, Michael H.	1883	Anal. of a Sulphuretted Mineral Water.
Dubois, Paul A.	1880	Grindelia Robusta.
D'Artenay, Eugene	1882	Berberis Aquifolium.
Elwert, Chas. P.	1881	Gelsemium Sempervirens.
Fevrier, J. P.	1881	Jaborandi.
Fitzell, Charles R.	1883	Humulus Lupulus.
Fletcher, David M.	1881	Assays of Cinchona Bark.
Gove, D. M.	1881	A Well-arranged Pharmacy.
Graham, Thomas D.	1875	Oxytropis Campestris.
Grazer, F. A.	1880	Berberis Aquifolium.
Green, Franklin T.	1882	Analysis of Well Water.
*Green, John A.	1883	Melaleuca Hypericifolia.
Hammit, Chas. H.	1881	Analysis of Piedmont Spring Water.
Harris, Henry R.	1876	Hydrocyanic Acid.
Helke, W. S	1878	Erythroxylon Coca.
Heany, J. P.	1874	Oreodaphne Californica.
Hulting, B. F.	1880	Arctostaphylos Glauca.
Hurtzig, W. F. N.	1881	Chloroform
Happersberger, Emil.	1882	Cinchona Culture in California.
Jones, Morgan L.	1883	Agave Americana.
Joy, Edwin W.	1878	Fluid Extracts by Repercolation.
Judson, Russell H.	1882	Carica Papaya.

Name.	Date of Graduation.	Thesis.
Kahn, Adolph J	1875	Pharmaceutical Education.
*Korper, Harry W	1883	Boldoa Fragrans.
*Krause, Frederick L	1884	Aqua Menthæ Piperitæ.
Leber, Albert L	1884	Euphorbia Ocellata.
Lengfeld, Felix	1880	Assays of Opium.
Leszynsky, Sam'l	1880	Peptone.
*Levison, Charles G	1884	Euphorbia Pilulifera.
Lindsay, Frederick G.	1883	Schinos Molle.
Loehr, George W	1884	Qualitative and Quantitative Tests of Dgs.
Lustig, Dan'l David	1881	Heteromeles Arbutifolia.
Mathewson, J. McL	1879	Mitchella Repens.
McDonnell, S. A	1878	Dialysed Iron.
†McLean, F. P	1875	Analysis of Magnesites.
McLaughlin, W. H	1878	Eriodictyon Glutinosum.
Mervy, Emile C	1879	Lupinus Chamissonis.
Messing, L. J	1879	Eucalyptus Globulus.
Meyers, Rob't C	1875	Sesame Oil and its Uses.
Minor, Geo. W	1879	Larrea Mexicana.
Morrison, W. P	1880	Table of Solubilities.
Moore, Berkeley W	1883	Pyrethrum Cinerariæfolium.
Moore, C. C	1878	Analysis of Soil.
Munson, James G	1884	Volumetric Tests of Arsenical Prep'tions.
Murphy, Martin J	1881	Amygdalus Communis.
Newby, Thomas S	1884	Chenopodium Californicum.
Oberdeener, George	1884	Rumex Hymenosepalus.
Oberdeener, Sam'l	1880	Pharmaceutical Notes.
Parker, E. S	1878	Aspidium Argutum.
Ray, Fred E	1876	California Opium.
*Reilly, Paul H	1883	Tannic Acid.
Rimpau, Frank T	1883	An Assay of Ore.
Rogers, Nathan	1876	Sium Latifolium.
Roturier, Emile	1883	Piperidine.
Scholl, A. L	1881	Zygadenus Fremontii.
Selzer, Edward	1877	Percolation *vs.* Maceration.
Skinner, Robert W	1883	Semen Bardanæ.
Smith, Arthur H	1879	Fucus Nodosus.
Sommer, Adolph	1879	Calcium Cyanide.
Troppman, Chas. M	1881	Rhododendron Occidentale.
Tryon, Jas. W	1882	Mimulus Glutinosus.
†Vreeland, Ph. L	1879	Syrupus Ferri Iodidi.
Young, Wilfred M	1882	Megarrhiza Californica.
*Wall, Henry A	1883	Erythroxylon Coca.
Walsh, Andrew D	1884	Malva Rotundifolia.
Weiss, Philip	1878	Leeches.
Whitney, William B	1884	Euphorbia Eremocarpus.
Wight, David	1882	California Drug Law.
Zemansky, J. H	1878	Nicotiana Tabacum.

*Certificate of Proficiency. †Deceased.

STUDENTS OF 1884.

SENIORS.

Name.	Nativity.	Preceptor.
Ball, Henry Augustus	Illinois	Nelson, Ball & Co.
Barbat, Josephine Eugenie	Cal	Dr. John Barbat
Beaizley, George Theophilus	Australia	W. M. Searby
Besthorn, Henry E. D.	Germany	E. W. Runyon
Cotter, Thomas Stephen	Cal	Dr. McDermott
Davis, William James	Cal	F. B. Hulting
Dick, William Henry	Cal	G. Leipnitz & Co.
Dorrance, Ralph Gregory	Michigan	N. S. Thompson
Emmal, William Boon	Cal	John Devine
Friedhofer, William		C. A. Bayly
Hughes, Thomas Heuston	Cal	J. R. Gates & Co.
Kelly, Frank Stanislaus	Cal	H. B. Slaven
Krause, Frederick Louis	Cal	E. W. Runyon
Leber, Albert Louis	Cal	Bart Morgan & Co.
Levison, Charles Gabriel	Nevada	Dr. Strong
Loehr, George William	Cal	P. Flatow
Martin, William Henry	New Zealand	W. J. Bryan
Meyer, August William	Illinois	W. W. Kilbourn
Munson, James Grant		Steylaars & Rossi
Newby, Thomas Sheridan	Missouri	T. M. Edwards
Oberdeener, George	Cal	F. Grazer
Roethe, Charles	Cal	C. Roethe
Ruiz, Louis Philip	Cal	C. F. Richards & Co.
Stecher, Edward	Cal	J. G. B. Broemmel
Tjader, Curry W.	Nevada	A. M. Kurtz
Topley, James Henry	Cal	John Calvert
Walsh, Andrew Desmond	Cal	Will Frisbie
Whitney, William Benjamin	Maine	Wright & Brown
Zweybruck, Frederick	Cal	E. W. Runyon

JUNIORS.

Name.	Nativity.	Preceptor.
Argenti, Frank William	Cal	J. H. Dawson
Boalt, Thomas Warren	Cal	Hansen & Boalt
Bond, Frederick Taylor	Cal	John Calvert
Crane, Samuel Frank	New York	

Name.	Nativity.	Preceptor.
DOUGLAS, WILLIAM H.	Missouri	E. C. Burr, Ph.D.
DROSSEL, AUGUST ADOLPH	Cal	J. H. Drossel
FRANCIS, WILLARD HUGO	Cal	
GALLWEY, JAMES AMBROSE	Cal	G. Liepnitz & Co.
HAHMANN, PAUL THEODORE	Cal	E. W. Joy
HALL, JOSEPH UNDERWOOD	Nevada	J. Jones (Gold Hill)
HARDING, JOHN HERBERT	Mass	
HILBY, FRANCIS MARTIN	Cal	F. M. Hilby
HUGHES, SAMUEL F	Penn	C. L. Barrington
JANUARY, JAMES	Cal	Val. Schmidt & Co.
LEARY, PATRICK JOSEPH	New York	H. B. Slaven
MALONY, EDWARD JAMES	Cal	Stoddart Bros.
MAYER, OSCAR JOSEPH	Germany	
MERRILL, CLARENCE SIDNEY	Cal	S. S. Merrill
PATTON, WILLIAM JESSE	Oregon	C. W. Corneliutt
PRESLEY, WILLIAM HENRY	Cal	G. G. Burnes
PRIEN, HARRY FREDERICK	Germany	F. C. Keil
REILLY, EUGENE CROWELL	Cal	P. J. Reilly
SCHMELZ, CHARLES JOSEPH	Germany	R. Urban, M.D.
SMITH, EDWARD WALLACE	Cal	Kirkland & Torwbridge
SKILLING, HARVEY HENRY	Illinois	W. V. Grimes, M.D.
TURNER, GUY SYLVESTER	Cal	W. W. Granger

LIST OF MEMBERS

OF THE

CALIFORNIA PHARMACEUTICAL SOCIETY.

ANDERSON, WINSLOW, M. D.....San Francisco
ARGENTI, J. J. B.....859 Market Street
BALL, H. A.....Portland
BALL, R. L.....Portland
BARBAT, J. HENRY.....910 Pacific Street
BARRINGTON, CHAS.....525 Montgomery Avenue
BAXTER, ED. H.....Pine and Front Streets
BECKETT, F. ARTHUR.....531 Market Street
BEHR, HERMANN H., M. D.....San Francisco
BORCHERS, ANNIE MRS.....Kingsburg
BRAINARD, GEO.....Cor. Bush and Fillmore Streets
BRYAN, WM. J.....Grand Hotel
BUSSENIUS, H. R.....St. Helena
CALEGARIS, JOS.....Pacific and Kearney Streets
CALVERT, JOHN.....Fourth and Howard Streets
CALVIN, WM. H.....Camptonville
CHAPMAN, P. F.....Portersville
COLBY, N. T.....San Buenaventura
COFFIN, R. W.....Sixteenth and Valencia
COLE, A. M.....Virginia City, Nev.
COON, HENRY I.....318 Clay Street
COXE, B.....San Francisco
CRANE, H. A.....San Francisco
CRAWFORD, J. S. B.....Winters
D'ARTENAY, E.....Post and Mason Streets
DAVIS, JOHN F.....Calico
DAWSON, JOHN.....Twenty-third and Valencia
DEVINE, JOHN.....Clay and Kearney Streets
DROSSEL, J. H.....Jackson and Powell Streets
EITENMUELLER, HARRY.....Green and Dupont Streets
EVANS, A.....510 Hayes Street
FITZELL, CHAS.....Eureka
FLEISCHMAN, FRED.....Tucson, Arizona
FLETCHER, DAVID.....Cor. Stockton and Geary Streets

FOUCH, JOHN F. ..... Williams
FOWLER, GEO. H. ..... Howard and Seventh Streets
FREUND, ROBERT H. ..... Benicia
GATES, A. L. ..... 1760 Seventh Street, West Oakland
GATES, JAS. R ..... Sansome and Commercial Streets
GEARY, WM. ..... Sacramento
GRAZER, F. ..... 113 Fulton Street
GROS, ALFRED. ..... Kearney and Washington Streets
GUIRADO, R. C. ..... Los Angeles
HAMMITT, CHAS. ..... Oakland
HAMMER, M. S. ..... Sacramento
HAPPERSBERGER, EMIL. ..... 326 Sutter Street
HEICK, WM. ..... Golden Gate Ave. and Polk Streets
HEINEMAN, S. C., M. D. ..... Globe, Arizona
HEITSHU, SAMUEL ..... Portland
HEYERMAN, J. C. ..... Fourth and Bryant Streets
HORSTSNEYDER, J. ..... Santa Cruz
HUNT, D. D. ..... Cor. Folsom and Fifth Streets
HURTZIG, W. F. N. ..... Third and Everett Streets
JOLLY, JESSE. ..... Placerville
JONES, JOHN JR. ..... Gold Hill, Nev.
JOY, EDWIN. ..... Market and Ellis Streets
JUDSON, R. H. ..... 320 Sansome Street
KEARNEY, P. A., M. D. ..... First and Folsom Streets
KEIL, FRED. C. ..... 2000 Market Street
KELLOGG, GARDNER A. ..... Seattle, W. T.
KERN, ALBERT ..... Sixth and Folsom Streets
KIRKLAND, D. W. ..... Tenth and Broadway, Oakland
KOLLIKER, FRED. ..... Sacramento
LABOYTEAUX, C. H. ..... San Francisco
LANGDON, E. W. ..... Albany, Or.
LEBER, A. L. ..... Oakland
LEE, LEROY. ..... Chico
LEIPNITZ, G. ..... 236 Sutter Street
LENGFELD, A. L. ..... Geary and Stockton Streets
LENGFELD, FELIX ..... Geary and Stockton Streets
LEVI, A. B. ..... Market Street
LINDSAY, F. G. ..... Woodland
MACK, ADOLPH ..... 11 Front Street
MATSCHECK, FERDINAND ..... 1116 Folsom Street
MCDONNELL, S. A. ..... 327 Montgomery Street
MCKOWN, J. P. ..... Livermore
MAYER, O. J. ..... San Francisco
MICHAELS, HENRY ..... Pine and Front Streets
MOORE, CHAS. M. ..... Victoria, British Columbia

MUNSON, J. G.....1633 Mission Street
MUELLER, F.....531 Market Street
MURPHY, M. J. (Mc K. & R.).....New York
OBERDEENER, SAMUEL..... Santa Clara
PAINTER, EMLEN.....New York
PERWO, WALTER.....528 Pacific Street
PETIBEAU, E.....Cor. Ninth and Howard Streets
PICKERING, WM .....Broadway and Stockton Streets
PREUSS, ED.....Los Angeles
REDINGTON, WM. P..... .....531 Market Street
RICHARDS, C. F.....Sansome and Clay Streets
ROETHE, C.....Third and Bryant Streets
ROICE, ED.....1001 McAllister Street
ROSSI, P.....318 Montgomery Ave.
ROTURIER, EMILE.....San Francisco
RUDOLPH, J. F..... .....Sacramento
RUIZ, L. F..... ...San Francisco
RULE, J. W.....San Francisco
RUNYON, E. W.....531 Market Street
RYAN, DANIEL.....Oakland
SANDELIN.....Seventh and Willow Streets, West Oakland
SCHRECK, E. A.....234 Sutter Street
SCHMIDT, VALENTINE.....Polk and Pine Streets
SCHOLL, ALBERT.....Fifth and Mission Streets
SCRIBNER, J. C.....Angels, Calaveras Co.
SEARBY, WM. M.....859 Market Street
SHAW, H. B .....Sutter and Powell Streets
SIMMONS, W. A .....Arcata, Humboldt Co.
SOMMER, ADOLPH..... .....West Berkeley
STEELE, JAS. G.....Palace Pharmacy
STEYLAARS, C.....Seventeenth and Dolores Streets
SKINNER, R. W.....Eureka
TITUS, J. S.....Hayes and Laguna Streets
TOPLEY, JAS.....Vallejo
TROPPMANN, CHAS. M.....Sixth and Folsom Streets
TSCHIRNER, MAX.....236 Sutter Street
WASHBURNE, M. A.....Sacramento
WEINMANN, LOUIS.....Benicia
WENZELL, W. T.....Drumm Street
WHITE, R. E.....Cor. Hayes and Gough Streets
WIDBER, J. H.....Third and Market Streets
WORDEN, CLINTON E.....326 Townsend Street
WRIGHT, A.....Healdsburg
YOUNG, JOS.....1116 Folsom Street
ZEILE, CHAS. D.....528 Pacific Street
ZEILIN, W. Z.....Sacramento

ALUMNI ASSOCIATION

—OF THE—

California College of Pharmacy.

CONSTITUTION AND BY-LAWS

—AND—

PAPERS READ AT PHARMACEUTICAL MEETING,

HELD JANUARY 20TH, 1885.

CONSTITUTION

OF THE

ALUMNI ASSOCIATION

OF THE

CALIFORNIA COLLEGE OF PHARMACY.

ARTICLE I.

SECTION 1. This Association shall be called the "Alumni Association of the California College of Pharmacy."

SEC. 2. Its design shall be to advance the interests of the College, to bring its graduates into closer fellowship with each other, and to promote sociability and good feeling among them; to advance the science and art of Pharmacy, to encourage and assist undergraduates, and to keep a record of the Pharmaceutical work and services of its members.

ARTICLE II.

SECTION 1. All graduates of the California College of Pharmacy are eligible for membership.

SEC. 2. This Association shall hold its meetings annually. A quorum shall consist of not less than eight members.

ARTICLE III.

SECTION 1. The officers of the Association shall be a President, a Vice-President, a Secretary, a Treasurer, elected annually, and an Executive Board of four, of whom two shall be elected annually, to serve two years.

SEC. 2. All the above-named officers shall be elected by ballot at the annual meeting, and shall enter upon their duties at the next regular meeting of the Executive Board, holding office until relieved by their successors.

ARTICLE IV.

SECTION 1. Such sums as may be bequeathed or donated to the Association, and such surplus funds as may, from time to time, be voted by the Association, and set apart for this use, shall be safely invested or deposited by the Treasurer, and shall constitute a fund which shall not be used by the Association for its current expenses.

ARTICLE V.

SECTION 1. Every proposition to alter or amend this Constitution shall be submitted in writing to the Executive Board, on or before its October meeting; said Board shall notify the members of such proposed alterations or amendments, and shall present them to the next annual meeting for action, when, upon receiving the votes of two-thirds of the members present, they shall become a part of this Constitution.

BY-LAWS.

ARTICLE I.

DUTIES OF THE PRESIDENT AND VICE-PRESIDENT.

SECTION 1. The President shall preside at all meetings of the Association, and in his absence the Vice-President. In the absence of both, the senior member of the Executive Board present shall perform the duties of the President.

SEC. 2. In meetings, the President shall take the chair at the appointed time and call the Association to order, when he shall perform such duties as appertain to his office, according to the laws and usages of deliberative bodies.

SEC. 3. He shall appoint all committees, unless otherwise provided for in these By-Laws or directed by the Association, sign the certificates of membership, and countersign all orders on the Treasurer.

SEC. 4. He shall present at the annual meeting an address on subjects of professional interest, embodying a report on the work of the Association during the year, with such suggestions for its future guidance as his experience may suggest.

ARTICLE II.

DUTIES OF THE SECRETARY.

SECTION 1. The Secretary shall keep a correct record of the proceedings of the Association and Executive Board, and carefully preserve and file all reports, essays and papers received by the Association, and furnish such copies or extracts as may be required for publication.

SEC. 2. He shall furnish the chairman of every committee with a list of its members, and a draft of the business submitted, and notify each member of his election, and the time and place of every meeting.

SEC. 3. He shall collect all moneys due the Association, and pay the same to the Treasurer, taking his receipt for the same.

SEC. 4. He shall conduct the correspondence of the Association, keeping copies of all letters written by him relating to its affairs.

SEC. 5. He shall report to the Executive Board, when required, and furnish them with such papers as they may need.

SEC. 6. The Secretary shall keep a record of each member, showing when and where he was born, the name of his preceptor, the subject of his thesis, the date of his graduation, the honors or prizes won by him, and other facts of interest.

SEC. 7. He shall report to the Executive Board the titles of papers written or other pharmaceutical work performed by members, which may come to his knowledge, and shall record the same when so directed by the Board.

SEC. 8. He shall communicate, if possible, with each member once a year, asking for information of changes in business or professional engagements, and may record the same, with the member's permission.

SEC. 9. He shall file and preserve all letters and other papers belonging to his office, and shall make a written report to the Association annually, containing such information as may be of general interest.

ARTICLE III.

DUTIES OF THE TREASURER.

SECTION 1. The Treasurer shall take charge of all moneys belonging to the Association; he shall hold, sign and issue the certificates of membership; and shall pay no money, unless by order of the Executive Board, countersigned by the President.

SEC. 2. He shall keep a full and correct account of his transactions, and report to the Executive Board when required, and to the Association at its annual meeting, when his accounts shall be audited.

SEC. 3. He shall report to the Executive Board the names of such members as have failed to pay their annual contributions for two years, and of those who have neglected to return their certificates of membership, after having been officially disconnected with the Association, and duly notified to return them.

ARTICLE IV.

DUTIES OF THE EXECUTIVE BOARD.

SECTION 1. The Executive Board shall have the general management of the affairs of the Association under its directions.

SEC. 2. It shall hold its meetings in January, March, June and October, when three members shall constitute a quorum. The meetings shall be open to all members of the Association, but only members of the Board shall vote.

SEC. 3. The officers of the Association shall be, ex-officio, members and officers of the Executive Board.

SEC. 4. The Board may make such assessments as may be considered necessary.

ARTICLE V.

MEMBERSHIP.

SECTION 1. Any graduate of the California College of Pharmacy, who desires to become a member of this Association, may make application in writing to the Secretary, when, by paying his fees and signing the Constitution and By-laws, he shall become a member.

SEC. 2. No graduate shall become a member of this Association, nor have his name placed upon the roll, until he shall have paid to the Secretary the sum of two dollars ($2) entrance fee, and his annual contribution for the current year.

SEC. 3. Every member shall pay in advance to the Secretary the sum of one dollar ($1) as his annual dues, and assessments when due.

SEC. 4. Members shall be entitled to receive a certificate of membership, signed by the President, Vice-President, the Secretary, and Treasurer.

SEC. 5. Resignations of membership must be made to the Secretary, in writing, and by him reported to the annual meeting; but no resignation shall be accepted from any one who is in arrears to the treasury.

SEC. 6. Any member may be dropped from the roll, after due notification, for non-payment of dues for two successive years, by vote of the Association.

SEC. 7. All charges against members of improper conduct, or violation of the Code of Ethics adopted by the Association, shall be made in writing to the President, who shall, at his discretion, cite the offending member to appear before the Executive Board to answer them. Should the charges be sustained, the Board shall report the offender at the annual meeting, when he may be expelled by a two-thirds vote.

SEC. 8. All members of the Faculty, past and present, shall be considered honorary members.

ARTICLE VI.

SECTION 1. There shall be elected annually five delegates to the meeting of the American Pharmaceutical Association. The President shall fill vacancies in the delegation from among members who signify their intention to be present at the meeting.

SEC. 2. The President shall appoint, at the annual meeting, a committee on Papers and Queries, consisting of three members, whose duty it shall be to procure answers to queries and papers on Pharmaceutical subjects, to be read at the meetings of the Association.

ARTICLE VII.

OF MEETINGS.

SECTION 1. The Annual Meeting shall be held as near Commencement Day as may be convenient.

SEC. 2. Regular Pharmaceutical meetings may be held at the call of the President.

SEC. 3. The order of business at the Annual Meeting shall be:

1st. Calling the roll.
2d. Reading of minutes of the previous Annual Meeting.
3d. Reading of the minutes of the Executive Board for the past year.
4th. Address of the President, and reference of any portion of it requiring action to an appropriate committee.
5th. Report of Treasurer, and reference to Auditing Committee.
6th. Reports of Committees, and action thereon.
7th. Report of Secretary.
8th. Applications for Membership.
9th. Election of Officers.

10th. Reading correspondence from absent members.
11th. Reading of Essays and Reports on scientific subjects.
12th. Unfinished business.
13th. New business.
14th. Adjournment.

ARTICLE VIII.

Of Rules of Order and Debate.

Section 1. The ordinary rules of parliamentary bodies shall be enforced by the presiding officer, from whose decision, however, appeals may be taken, if desired by two members, and the meeting shall thereupon decide without debate.

Sec. 2. When a question is regularly before the meeting and under discussion, no motion shall be received but to adjourn, to lay on the table, for the previous question, to postpone to a certain day, to commit or amend, to postpone indefinitely; which several motions shall have precedence in the order in which they are arranged. A motion to adjourn shall be decided without debate.

Sec. 3. No member may speak twice on the same subject, except by permission, until every member wishing to speak has spoken.

Sec. 4. On the call of any two members, the ayes and noes shall be ordered, when every member shall vote, unless excused by the chairman, and the names and the manner of voting shall be entered on the minutes.

ARTICLE IX.

Miscellaneous.

Section 1. In all points of order not noticed in these By-Laws, the Association shall be governed by the established usage in all assemblies governed by parliamentary rules.

Sec. 2. Every proposition to alter or amend these By-Laws shall be submitted in writing, and may be balloted for at any subsequent meeting, when, upon receiving the votes of two-thirds of the members present, it shall become a part of the By-Laws.

Sec. 3. No one or more of these By-Laws shall be suspended, except by the consent of two-thirds of those present.

SONORA GUM.

By FRED. GRAZER, PH.G., Class '80.

I was applied to by a customer a short time ago to furnish a few pounds of "Sonora Gum," as he called it, to be used in the manufacture of porter. Not having enough of the above named substance, and knowing little or nothing of its nature, I promised to get the same if obtainable. In this I was not successful. One firm, who make it a business to furnish brewers' supplies, stated that it had been kept by them, but the limited demand did not warrant its being kept any more. Not being able, therefore, to obtain it, the substance at my disposal in the store was taken to gratify my curiosity.

In external appearance it somewhat resembles a gum resin. When chewed, it has a peculiar acidulous taste. It does not appear to be very resinous.

Fifty grains of the substance was treated with ether, Sp. Gr. 730, which dissolved 21 grains of the substance, the solution having an acid reaction. This was allowed to evaporate spontaneously, and left a sticky substance having two strata, one being perfectly transparent and the other quite opaque. This portion was treated with a little distilled water, to which it imparted a feebly acid reaction, but contained nothing worthy of note. The substance remaining was heated, to expel the moisture present; next treated with seventy per cent. alcohol, and the alcoholic liquid evaporated on a water bath, leaving a transparent resinous residue. A portion of this, on being treated with liquor potassæ, dissolved with a bright red color. It was also soluble in chloroform. The substance remaining after treatment with seventy per cent. alcohol was next acted upon by ninety-three per cent. alcohol, which was heated on a water bath. This dissolved the entire residue, leaving, however, upon cooling, a white, waxy deposit (small amount). This was separated by filtration, and the filtrate, upon evaporation, left a resin soluble in chloroform and oil of turpentine, but insoluble in carbon disulphide.

The substance remaining, after being exhausted with ether, was next exhausted with ninety-three per cent. alcohol, and the alcoholic liquid evaporated by means of a water bath to dryness, leaving a dark brown and transparent residue, which had covered the bottom of the vessel in the form of a thin layer; and, upon its removal therefrom, resembled small pieces of shellac. The weight of this was nine grains.

The substance, after being exhausted by ether and alcohol, was next treated with distilled water, to which it imparted a decided acid reaction, and a dark amber color. This had the peculiar characteristic taste of the substance when chewed. The solution was evaporated by means of a water bath to dryness, leaving a dark purple residue. A portion of this, upon

being heated on platinum foil, readily took fire, and burned with a yellowish flame, without much smoke, emitting a somewhat fetid odor, and leaving but a small amount of ash.

The substance, after having been acted upon by these various solvents, was treated with hot water and allowed to cool. The solution had a light red color. To a portion of this, liquor potassæ was added, the color turning to a deep red. The same reaction took place with water of ammonia and baryta water; also with plumbic acetate, forming in this case a deposit at the same time. Sulphuric acid did not affect the color. A portion of this coloring matter, which always had an acid reaction, and which seemed to be extracted most readily with hot water, when neutralized with alkalies, was always turned to a deeper color, but soon formed a dark red deposit, leaving the supernatant liquid but slightly colored. From this, I conclude the coloring matter to be an acid principle, easily soluble in hot water, less so in cold; also taken up to a small extent by alcohol and ether.

The substance was next acted upon by an alkaline solution, when it became thick and viscid, evidently from the presence of protein substances.

Upon comparing my notes with those contained in several books of reference, I found that this so-called "Sonora Gum" was evidently the exudation from the branches of Larrea Mexicana, which has been referred to under the title of "Arizona Shellac" in the "American Journal of Pharmacy," 1880, page 409, and taken from a paper read by Prof. Stillman at a meeting of the California Academy of Sciences. Mr. B. B. Redding, at the same meeting, referred to the plant as a source from which our commercial shellac could be obtained, stating that these lac-yielding plants, including Acacia Greggii, were as plentiful as the so-called sage brush, from southern Utah to New Mexico, and from the Colorado desert to western Texas, the lac being most abundant around stations on the Mojave and Colorado deserts. The exudation, which takes place as the result of an insect's sting, would be easily collected by boiling the twigs in hot water, the gum (?) which rises to the top being skimmed off, strained, and dried on smooth stones, and hand-pressed into flakes, ready to make sealing wax or varnish. The plant requires a rainfall of three inches a year. This plant has also been the subject of a thesis by one of the graduates of this College, in the examination of which, however, no reference was made to the exudation.

January 20, 1885.

A SUSPICIOUS SPECIMEN OF PULVIS CAPSICI.

(Abstract of a paper read at the Alumni Meeting.)

By F. F. GREEN, PH.G.

The peculiar appearance of this specimen led me to suspect its adulteration in some form.

Two other specimens were procured from different sources. They were examined as follows—for convenience they were designated Nos. 1, 2, and 3.

MICROSCOPICAL EXAMINATION.

No. 1. Color bright, reddish orange, with particles, shown as coarse fragments; distinct, and of a resinous appearance, as if saturated with resin.

No. 2. Color dull, yellowish orange, particles more or less adherent; the separate grains differing slightly in color, evidently denoting their relative richness in oleoresin.

No. 3. Reddish, brickdust color. The particles of capsicum were indistinct, being obscured by an adherent powder. The peculiar color of the suspected sample was due to this powder.

Taste revealed but little. No. 3 lacked the pungency of Nos. 1 and 2.

Tinctures were made according to the formula of the U. S. P., 1880, 100 grains of the powder being used for each.

No. 1. Clear, bright orange color.
No. 2. A little paler.
No. 3. Dark color, resembling Tr. Arnicæ.

The residues were dried at 100 deg. C., and weighed. Loss of weight in

No. 1. 1.33 grs.
No. 2. 1.40 grs.
No. 3. .98 grs.

100 cc. of each tincture was evaporated, and the extract died.

No. 1 weighed 1.54 grs.
No. 2 " 1.56 grs.
No. 3 " .76 grs.

This shows how deficient No. 3 is in oleoresin.

The extracts were treated separately with ether, filtered, and the ether spontaneously evaporated.

Nos. 1 and 2 responded to all the tests for Oleoreisn of Capsicum. No. 3 was of a black-brown color, slight odor, and much less pungent than the others.

All this proves that No. 3 is grievously adulterated. Yet, the nature of the adulterant has not been shown.

A portion of each sample was burned on platinum foil. No. 3 left a very

large residue. This residue, when tested for iron, showed it present in large quantity. Further investigation and analysis proved that the sample contained as much as 25 per cent. of an iron earth, and this earth is Venetian red. The oleoresin and tincture made from the specimen indicated that the capsicum was old and faded. Evidently, the iron was added to make up the deficiency in color, and also to increase its weight.

GLYCERINE.

By J. J. B. ARGENTI, PH.G.

Will the glycerine of our market correspond to the requirements of the Pharmacopœia? The Pharmacopœia defines glycerine as a liquid obtained by the decomposition of fats or fixed oils, and containing not less than 95 per cent. of absolute glycerine. ($C_3H_5{}_3HO$.)

It is described as a clear, colorless liquid, syrupy in consistence, oily to the touch, hygroscopic, odorless, and of a sweet, slightly warm taste. Sp. gr., not less than 1.250 (indicating 95 per cent. absolute glycerine), soluble in water and alcohol, insoluble in ether and chloroform. If a fused bead of borax, on a loop of platinum wire, be moistened with glycerine, made alkaline with a weak solution of soda, and after a few moments held in a colorless flame, the latter should be tinted a deep green.

The Pharmacopœia requires glycerine to be neutral to litmus paper. On warming a portion with one-half its weight of dil. H_2SO_4, no butyric or other acidulous odor should be developed. If gently warmed with an equal volume of H_2SO_4 in a test tube, it should not become dark colored. (Absence of cane sugar.) About two grms. heated in a small open porcelain capsule on a sand bath until it boils, *and* then ignited, should burn *and* vaporize so as to leave not more than a dark stain. (Absence of sugars and dextrin.) A portion heated to 185 degrees Fahrenheit, with Fehling's test solution, should not give a yellow brown precipitate. Diluted with ten times its volume of distilled water, portions should yield no precipitate or colors, on the addition of test solutions of $Ag\,No_3{}_1Ba\,Cl^2$, $Ca\,Cl_2$, $(NH^4)\,{}_2S$ $(NH_4)_2C_2O_4$. (Absence of H Cl, H_2SO_4, $H_2C_2O_4$, and iron or calcium salts.)

In order to ascertain whether the glycerine sold in the San Francisco market would correspond to these requirements and tests, five samples were obtained and used for the work. All of the samples corresponded with the description of the Pharmacopœia.

The results obtained on using the tests are as follows. For convenience the samples have been lettered A, B, C, D, and E respectively.

Sample.	Density.	Odor.	Reaction.	Mixed and then warmed with ½ its vol. dil H_2SO_4.	Mixed with an equal vol. H_2SO_4 (conc.) Then allow to cool.	The cold mixture gently warmed.	2 grms. heated to boiling, then ignited. Residue.	Diluted with H_2O boiled with H_2T. Then added Fehling's Test Solution.
A.	1.250	None.	Neutral.	No odor develop'd	No change.	A slight color.	Stain black. Brown in color.	No change or ppt.
B.	1.253	"	"	"	"	Slight brown colorat'n.	Residue, black-brown.	"
C.	1.250	"	"	"	"	No change.	Stain slightly more than in A.	"
D.	1.260	"	Very slightly Acid.	"	A decided change, light brown.	Slightly darker.	Residue, black.	"
E.	1.255	"	Neutral.	"	A slight discoloration, yellow.	"	"	"

The addition of the test solutions (of $Ag\,No_2$, $Ba\,Cl_2$, $Ca\,Cl_3$, $(NH_4)_2\,S$. $(NH_4)_2\,C_2O_4$) caused in no sample a precipitate; indicating the absence of Chlorides, Sulphates and Oxalates, and also of Iron and Calcium Salts.

COMPOSITION OF MENTHOL PENCILS.

By FREDERICK GRAZER, PH.G., CLASS '80.

Under various names, several firms have introduced the Stearopten Menthol, formed into cones, and inclosed in variously constructed receptacles. I selected the following: Parke, Davis & Co.'s Menthol Pencils, Wyeth's Menthol Pencils, Valentine's Menthol Pencils, Requa & Wetmore's Menthol Pencils, and Bradford's Vinaigrettes.

The "Pharmaceutische Rundschau" of May, 1884, quotes from the "Pharmaceutische Centralhalle," under the heading of "Testing Menthol Pencils," the following:

Pure Menthol, when spread upon white note paper and gently warmed, will be completely dissipated by sublimation, without leaving a greasy stain upon the paper. The cone must have a camphor-like transparency, and

when scraped, not have a waxy luster or appear fatty, but rather brittle. The low melting point of Menthol—36 deg. C. (or 96.8 deg. F.)—is in itself an indication of its purity. It is directed to take the scrapings from one or more pencils, and to transfer these to the bottom of a dry, narrow test tube, and immerse the lower part into water, having a temperature of 38 deg. C. (or 100 deg. F.); at this temperature the substance must melt, and not gradually but at once; by this mode of treatment most adulterations may be detected, their melting point being higher. Paraffin and Cacao Butter, which have a low melting point, would be easily detected by the first method, by their greasy stain upon paper.

Among the first things I proceeded to do, was to find the weight of each of these cones, and the depth of the socket of the holder, which is as follows:

Parke, Davis & Co.,	weight of pencil	30	grs.,	depth of holder					$\frac{1}{4}$	inch.
Wyeth & Bro.,	"	"	"	30	"	"	"	" trifle over	$\frac{1}{4}$	"
Bradford's Vinaigrette	"	"	"	28	"	"	"	" trifle over	$\frac{3}{8}$	"
Valentine's	"	"	"	18	"	"	"	" barely	$\frac{1}{4}$	"
Requa & Wetmore's	"	"	"	18	"	"	"	"	$\frac{1}{4}$	"

A few of these were submitted to sublimation; this was done on a water bath, which was covered with a tin vessel, the edges being turned up; upon this was placed a watch glass, containing a portion of the cone, and over this a bell glass. No attention was paid to temperature, which was allowed to approach the boiling point. There was quite a difference in the result with each of the cones thus acted upon. From the Vinaigrette, I was able to sublime nearly the entire amount of Menthol; the inside of the bell jar, upon cooling, becoming covered with a beautiful sublimate of the substance having the odor of Menthol, which dissolved readily in alcohol. The remaining traces of Menthol were then expelled with a more direct heat without the bell jar, and the residue found to correspond to 12 grains of the entire weight of the cone, which, when placed in a test tube and immersed in hot water, did not fuse until the temperature of 155 was reached. It was readily saponified by Liquor Potassæ, and turned to a dark brown color when warmed with Sulphuric Acid. These few tests gave indications of its being white wax.

Wyeth's Menthol Pencils differ materially from the article just described; they are more translucent, crystalline, and brittle, and have a more powerful odor; when cut transversely, they somewhat resemble the transverse section of a dicotyledonous stem, with the medullary rays radiating from the pith to the circumference. When subjected to sublimation, as in the preceding case, quite a difference was observed, inasmuch as there was scarcely any sublimate; and that portion which did sublime assumed the form of crystalline drops, the bell jar being filled with a grateful peppermint odor. The substance remaining on the watch glass was found to weigh 28 grains,

showing a sublimate of 2 grains, which readily dissolved in alcohol. The 28 grains were next acted upon by alcohol, and treated to near the boiling point, when solution was effected. This was allowed to cool, when a deposit formed, which, upon being separated, was found to weigh 3 grains, and proved to be white wax.

Parke, Davis & Co.'s somewhat resemble Wyeth's, having a crystalline appearance, a grateful odor, brittle, the major portion fusing at 110 deg. F., beginning to congeal again at 100 deg. F., entirely soluble in hot alcohol, upon cooling, scarcely deposits anything, and can be recommended as the purest of these preparations in the market.

Valentine's Menthol Pencils have a weight of only 18 grs., and are introduced as the usual cheap article, to be retailed at ten cents. This article somewhat resembled the action of Bradford's Vinaigrette, when subjected to sublimation, filling the jar upon cooling with a mass of long, feathery crystals, readily dissolved by alcohol. A portion of the cone heated in a test tube did not melt until a temperature of 150 deg. F. was reached, congealing again at 120 deg. F.; treated with alcohol, and heated to a temperature of 178 deg. F., complete solution did not take place ; a portion remained in the bottom of the hot alcohol in the form of a transparent globule. When the alcoholic liquid was allowed to cool, a copious white deposit formed; this was separated and found to weigh 12 grains. A portion of this, fused at a temperature a little over 130 deg. F., was not saponified by Liq. Potassæ, and did not react with Sulphuric Acid, when heated in a water bath, assuming only a reddish color, the substance being Paraffin.

Requa & Wetmore's Menthol Pencils were found to weigh 18 grains, being semi-transparent; when cut, exhibiting a waxy luster, somewhat soft; fusion was gradual, and not complete until the temperature reached 150 deg. F., congealing again at 122 deg. F., giving the same reactions as the preceding; out of 18 grains, the total weight of the cone, 14 grains were Paraffin.

The following is the result of these few experiments :

Parke, Davis & Co.'s	Menthol,	30	grains,	adulteranto.		
Wyeth & Bro's.	"	30	"	white wax,	3	grains.
Bradford's Vinaigrette	"	16	"	"	12	"
Valentine's,	"	6	"	Paraffin,	12	"
Requa & Wetmore's	"	4	"	"	14	"

It would be somewhat unjust to look upon the small amount of white wax in Wyeth's Pencils as an adulteration, which may have been added to lend firmness and prevent evaporation.

January 20, '85.

WILL THE CHLOROFORM OF COMMERCE CONFORM TO THE REQUIREMENTS OF THE U. S. P.?

FELIX LENGFELD, PH.G.

Though the above query suggested the following experiments, I have not attempted to answer it, but have merely examined the products of four manufacturers, which are the principal brands in this market. One of these is put up in an amber-colored glass-stoppered bottle, one in an amber colored cork-stoppered bottle, and the others in cork-stoppered flint bottles. One is labelled Purified Chloroform, one Pure Chloroform, and two simply Chloroform. The U. S. P. tests for the purity of Chloroformum and Chloroformum Purificatum were applied to all four samples. These were numbered 1, 2, 3 and 4. The physical properties were first examined, and each was found to be a colorless, limpid, diffusive liquid, not inflammable, of an ethereal odor, hot saccharine taste, neutral reaction, soluble in about 200 parts water, and in all proportions in alcohol and ether. The specific gravity of No. 1 was 1.491, of No. 2, 1.489, of No. 3, 1.460, and of No. 4, 1.491. No. 1 boiled at 61 deg. C., No. 2, between 61 deg. and 62 deg. C., No. 3, between 62 deg. and 63 deg. C., and No. 4, between 61 deg. and 62 deg. C. Chloroformum (U. S. P.) should have a specific gravity not lower than 1.470, and Chloroformum Purificatum (U. S. P.) should have a specific gravity between 1.485 and 1.490, and should boil at 60 deg. to 61 deg. C. The U. S. P. test for Chloroformum is as follows: If 1 c. c. be agitated with 20 c. c. water, the latter when separated should not render test solution of nitrate of silver more than slightly turbid (limit of foreign chlorine compounds). When shaken with an equal volume of sulphuric acid, the subsiding acid layer should not become quite black in 24 hours. A portion evaporated should leave no fixed residue. All the samples stood these tests.

If 5 c. c. of purified Chloroform be thoroughly agitated with 10 c. c. of water, the latter, when separated, should not affect blue litmus (absence of acids) nor test solution of nitrate of silver (absence of chlorides) nor test solution of iodide of potassium (absence of free chlorine). If a portion be digested (warm) with solution of potassa, the latter should not become dark-colored (aldehyde). On shaking 10 c. c. of the Chloroform with 5 c. c. sulphuric acid in a glass-stoppered vial, and allowing them to stand 24 hours, no color should be imparted to either liquid. If a few c. c. be allowed to evaporate from blotting-paper, no foreign odor should be perceptible after the Chloroform odor has disappeared. In all four cases the separated water was free of acids and free chlorine. On digesting with solution of potassa, No. 4 became slightly brownish, No. 3 less so, and Nos. 1 and 2 unaffected. On shaking No. 1 with sulphuric acid, both liquids were colorless at the end of 24 hours. On shaking No. 2 with sulphuric acid, both liquids remained colorless, but a light brown line appeared between them.

On shaking No. 3 with sulphuric acid, the top of the acid became brown in 3 hours, and at the end of 24 hours the entire acid layer was brown. On shaking No. 4 with sulphuric acid and allowing to stand 24 hours, the surface of the sulphuric acid became deep brown, this color extending with gradually diminishing intensity about 1-20 inch into the acid. In making the tests for chlorides, I observed that when the mixture of separated water and nitrate of silver solution was allowed to stand a few hours, a dark coloration appeared, most marked in Nos. 1 and 4, without turbidity. On now adding a drop of nitric acid, the coloration disappeared, the liquid becoming turbid. On first adding the nitric acid, then the nitrate of silver, no coloration was observed. On adding the nitrate of silver and then ammonia, and boiling for a short time, all four solutions threw down a copious black precipitate. This precipitate appeared quickest in Nos. 1 and 4, Nos. 2 and 3 requiring a longer time. On first adding the ammonia, then the nitrate of silver, the reaction was less marked. Filtering, the filtrate contained a cyamine and a chloride, and the precipitate proved to be silver. From this I concluded that this reaction was due to the reduction of the silver salt by some organic impurity, and that a portion of the Chloroform was decomposed by some of the products of this reaction. Upon further investigation I found a trace of formic acid in all the samples, and I believe the reduction of the silver compound is due to this. I may here mention that M. Jaillard found formic acid in Chloroform exposed for sale.

I may summarize as follows :

	Specific Gravity.	Boiling Point.	Acids.	Chlorides.	Free Chorine.	Adelhyde.	Organic Impurities charred by Sulphuric Acid.
1.	1.491	61° C.	None.	None.	None.	Trace.	None.
2.	1.489	61°-62° C.	None.	None.	None.	Trace.	Trace.
3.	1.460	62°-63° C.	None.	None.	None.	Trace.	Objectionable Amt. Present.
4.	1.491	61°-62° C.	None.	None.	None.	Present.	Present.

ANNATTO.

By FRED. GRAZER, PH.G., CLASS '80.

The subject of this paper, although the product of an unofficinal plant, nevertheless merits some attention on account of its extensive use in coloring butter and cheese, beautifying and seasoning some dishes; also for dyeing silk and wool.

Some enterprising firm has recently placed upon the market a liquid butter color, and since the writing of this paper I have met with another, the coloring matter in this case being suspended by means of oil. Each of these preparations is greatly extolled by the manufacturer, with the usual scientific testimonials.

With a view to knowing a little about the constituents of the first mentioned liquid color, I subjected the same to a few tests.

The color is dark red, the taste decidedly acrid and saline, and the reaction neutral to test paper. When heated upon platinum foil, it emitted a very fetid odor, burning with a yellowish flame, which, viewed through blue glass, presented a purple color, the residue being quite alkaline, and gave with the sol. of Platinic Chloride a bright yellow color.

A portion of the liquid was transferred to a small glass retort, and distilled nearly to dryness. The distillate had a light yellow color, and a neutral reaction, and proved to be water holding a small amount of the coloring matter in suspension, probably carried over mechanically. The residue in the retort seemed deliquescent. This was treated with 93 per cent. Alcohol, which dissolved a small portion, and left a salty substance, which, when heated upon platinum foil, emitted a peculiar stench, and left a residue having an alkaline reaction, and yielding precipitates with sol. Platinic Chloride and Argentic Nitrate.

The residue, which had been subjected to the action of Alcohol, was next treated with Ether, when upon evaporation a small portion of coloring matter remained, giving a blue color with Sulphuric Acid.

The substance after being acted upon by Ether and Alcohol had a dark brown-red color, saline taste ; heated upon platinum foil it was easily reduced to ash, the same having an alkaline reaction, effervescing with acids. When treated with ferrocyanide of Potassium, and a drop of Hydric Chloride, a deep blue color resulted, indicating iron. A precipitate resulted with Argentic Nitrate (Chlorides), Baric Chloride (Sulphates,) Lime Water (Carbonates), Platinic Chloride (Potassium) ; these were the predominant mineral and acid constituents.

It was now thought desirable to get at the coloring matter. A portion of the liquid was therefore treated with a quantity of Hydric Sulphate in slight excess ; this caused a dark red deposit, the entire coloring matter subsiding, which was then separated by means of a filter, washed and dried, a portion of this was dissolved in Chloroform, and also in Alcohol : To each of these it imparted a beautiful red color. A small portion of the Chloroformic solution was allowed to evaporate upon a watch glass, and brought into contact with a few drops of Sulphuric Acid, when the whole assumed a beautiful blue color. The same result was obtained with the Alcoholic solution, indicating the presence of "Bixin," the coloring matter in Annatto. Therefore we may safely state that Annatto is the base of this butter color, together with some alkali, evidently Potassium. But that this substance cannot be prepared from the Annatto, as usually found in

our shops, is an assured fact, as this imparts but a small quantity of its coloring matter either to water or an Alkaline solution. It is, therefore, either prepared from the seed direct, in some manner, or a better quality may be obtained. In referring to an article on Annatto, the late Dispensatory describes this as the reddish pulp surrounding the seeds in the fruit of Bixa Orellana, a middle sized tree growing in Guiana and other parts of South America. The reader is referred to an article on its cultivation and preparation by Mr. Theo. Peckholt, in the Amer. Journal of Pharm., 1859. The Dispensatory further states that the pulp is separated by bruising the fruit, mixing it with water, straining through a sieve, allowing the liquid to stand until the undissolved portion subsides ; the water being poured off, the remaining mass, after being sufficiently dried, is formed into flat cakes or cylindrical rolls.

Another process is referred to, in which the seeds are bruised, mixed with water, and the mixture allowed to ferment, the coloring matter being deposited during the fermentation, after which it is removed and dried. Two kinds are spoken of as entering commerce, the Spanish or Brazilian and French ; the former coming in baskets from Brazil, the latter in cakes from French Guiana. The French, which is called Flag Annatto, has a disagreeable smell, probably in being prepared by the process of fermentation, being superior to the Spanish as a dye stuff, which is without any disagreeable odor.

In an article by the elder Peckholt on the culture of Bixa Orellana, and the preparation of Annatto, Amer. Jour. Pharm., 1859, 369, we are introduced to an entirely different process from that described in our late text books. According to this author's description, the seeds of Bixa Orellana are kept over night under water in large tubs, and the seeds crushed by means of the hands against the sides of these vessels, the liquid strained through sieves ; this is repeated several times to exhaust the seeds ; the liquid is then allowed to settle. The supernatant portion is evaporated to a syrupy consistence, the sediment is then added and stirred until it has assumed the consistence of a thick extract, when it is removed from the fire and allowed to cool. The writer deplored the adulteration it was subject to even at that time (1859).

I have prepared some Annatto from the seeds, (trying to conform as nearly as possible on a small scale to Mr. Peckholt's process,) which you can examine.

There is also a specimen of the seeds, and a sample of the best Annatto obtainable in the New York market, which I received through the kindness of Dr. Hoffman, of New York city. Under the name of Annattoine, Redington & Co. furnished me with a sample having a close resemblance to that obtained from New York.

The coloring matter in Annatto is Bixin. The discovery of this principle, according to the Dispensatory and Artus's Plant Atlas, is claimed for Preisser, who describes the same as being crystalized in the form of white

needles, having a pleasant bitter taste, capable of being sublimed, readily dissolved in Alcohol and Ether, less soluble in water; exposed to the air becoming gradually yellow. The dark red color of Annatto is stated to be due to the combined action of the atmosphere and Ammonia upon the Bixin, and the dark red substance which resulted therefrom was called by him Bixein.

In referring to the literature under the head of Bixin, in Hussemann & Hilger's late work, and which I consider as one of the most thorough existing at the present time, no notice whatever is given of Preisser's researches upon this coloring matter, which is described as consisting of dark red scales having a metallic lustre, being soluble in chloroform, in hot Alcohol, not readily soluble in Ether, Benzol and Glacial Acetic Acid, and insoluble in water; melting point 175 to 176 deg. C. Sulphuric Acid dissolves the principle with a blue color, from which water will cause the separation of a dark green precipitate.

January 20th, 1885.

PHARMACY IN GERMANY.

(Read in Alumni Meeting, January 20, 1885.)

By CHAS. TROPPMANN.

Pharmacy is the art which teaches us the knowledge, choice, preservation, preparation, and combination of medicines. The various terms applied to those practicing this art are quite numerous; thus, we have the Pharacist, Pharmaceutist, Pharmacopola, Pharmacopœus, Pharmacurgus, Pharmacurgicus, Apothecary, Druggist, Chemist, and what not. All of them may be subdivided into three natural classes. Pharmacists, who are good Chemists—good Druggists—and lastly the largest class, those who are neither; but what we want, is a combination of the first two classes, and these are found in Graduates of this College, and those of the Eastern and European Colleges.

Although the laws to obtain a Diploma in Germany have changed but little in the last fifty years, some changes were made, and laws by which the existing form of pharmaceutical study has been established are "Bekanntmachung des Reichskawzlers vom 5th Maerz, 1875, betreffend der Apotheker," and the "Bekanntmachung des Reichskawzlers vom November 13th, 1875, betreffend die Pruefrueg der Apotheker gehuelfeu."

Upon proof having been furnished that the young man has passed the examinations which are demanded for an "ein jahriger Freiwilliger" in the army, which are, by the way, more severe than those corresponding with the English first or preliminary examinations, he may be accepted as an apprentice in a pharmacy. Three years of apprenticeship elapse, and he

then passes his first pharmaceutical examination (Gehuelfen pruefung), which is passed before a special board of examiners. Three questions are given him to be answered within six hours, in each of the branches, viz: botany, chemistry, materia medica, and physics. Practically, he is examined in prescription reading, preparing and taxing them, preparing some pharmaceutical preparations, examining the purity of two of the chemical preparations of the Ph. Germ. With these practical tests he must present his laboration journal, which he has prepared during the three years of apprenticeship, and which includes a short description of all the work he has done in the laboratory. The latter would be a splendid idea to introduce in the United States.

The oral examination consists in (a) recognizing and determining several fresh and dried plants; (b) explaining the derivation, adulteration, and pharmaceutical use of several drugs and chemical preparations; (c) translating two articles of the Ph. Germ.; (d) knowing the elements of botany, pharmaceutical chemistry, and physics.

With this oral ordeal, the young pharmacist must present his "herbarium vium," *i. e.* an herbarium which is collected and arranged by himself during his apprenticeship.

After passing this assistant examination, he must serve three years, and then prepare himself for the "Pharmaceutische Staats pruefung," examination for a State Diploma. After having spent one year and a half studying at a University, attending lectures, and doing practical work, he may present himself for this grand final examination.

It consists of five parts:

1st. Preliminary—(written). Three questions in botany or materia medica, in inorganic and organic Chemistry.

2d. Pharmaceutical Technical.—To make two "galenical" preparations and two chemico pharmaceutical preparations.

3d. Analytical chemical.—(a) Qualitative and quantitative (gravimetric volumetric) analyses. (b) Toxicological research (qualitative and quantitative).

4th. Pharmaceutical scientific (oral).—In botany, materia medica, and pharmaceutical chemistry.

5th. Final.—("Schlusspruefung") is also a scientific oral examination, and is held in botany, chemistry and materia medica, by the professors of the Universities, and in the laws of pharmacy by an apothecary.

Only after having passed this last examination has the "German Pharmacist" permission to possess a pharmacy.

This is the history of a German pharmaceutical student, and compared to our pharmaceutical students who now obtain their sheepskin at 60 per cent., it reminds me very much of the difference between Oil of Rose and Oil of Rosemary.

Some of the questions given at the final examinations, which lasted over four months, are:

What is the Nitrogen-Oxygen combination in relation to water?

Give a full description of the following; The Tartaric Acids, the Lactic Acids, Glycocole, Kreatin and Kreatinin, Aldehydes, Kakodyl combinations; the theory of Radicals and Atoms, Arsenical combinations, Volumetric Analyses, Chemical combination of the nourishment of plants, Ketone, Neurin and Lecithin, Analin colors, Naphtalin, Fluorescin, Hippuric Acid, Uric Acid and Biuret, Combination of Cyanides and Iron, Peptones.

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Describe all the Woods, and their structure, used in Pharmacy.

Give full and complete history and description of Cinchona barks known, their uses, preparations, alkaloids, tests, etc.

Describe all plants belonging to Nat. Ord. Labiatæ and Leguminosæ.

Describe all taken from the Animal Kingdom used in Pharmacy.

ALBUMEN OR PEPTONE AS AN EXCIPIENT FOR PILULÆ ARGENTI NITRATIS CONSIDERED FROM A CHEMICAL AND THERAPEUTICAL STANDPOINT.

By W. T. WENZELL, M.D., Ph.G.

(Read before the Adelphi Society of the Cal. College of Pharmacy.)

Having been asked by a medical friend to investigate the propriety of administering Nitrate of Silver as per following formula:

℞ Argenti nitratis.....gr. L.
Albuminis Ovi.....gr. XL.
Pulv. rad. altheæ.....q. s.
M. ft massa et in 120 pil. div.,

and to determine whether the Silver in combination with albumen was subject to immediate changes or reduction, the following experiments were made.

The pills were prepared by first pulverizing the silver nitrate, then adding the albumen with trituration, and finally incorporating the required amount of althea powder to form the mass, which was rolled out on a tile, and divided by means of a silver-plated spatula.

When nitrate of silver is added to egg-albumin, a sparingly soluble white and curdy precipitate of Silver albuminate is formed—a compound of nitrate of silver and albumin. This compound is so extremely sensitive that a solution containing 1–1000000 of the albuminate will reveal its presence by producing a violet color, whenever such a solution is exposed to direct sunlight. This compound of Nitrate of Silver and albumin seems quite a stable one, providing it be kept from the influence of light, as the examination of some pills which were three months old showed that no appreciable change had taken place up to that time.

Coincident with this subject, it occurred to the writer to investigate the action of hydrochloric acid, and also that of the soluble chlorides upon this silver albuminate. It has heretofore been the custom of physicians prescribing nitrate of silver for internal use to interdict the use of common salt; as it was assumed on chemical grounds that an inert chloride of silver would be formed, and thus injure the medicinal effect of the drug. My experiments have demonstrated that when a solution of nitrate of silver is added to albumen, the silver albuminate is always formed, but that the same result is also obtained when the silver salt in solution is added to a solution of albumen previously acidulated with hydrochloric acid, or in the presence of common salt. No chloride of silver is formed in these instances, as one would *a priori* expect; and moreover, it was shown that the silver albuminate was quite soluble in an excess of hydrochloric acid, and also in sodium hydrate without decomposition.

The changes which this pill was likely to undergo in the stomach during the process of digestion, was the next subject for investigation.

Before proceeding it is perhaps in place to mention, that a solution of peptone, prepared from blood fibrin, was found to yield with nitrate of silver a precipitate of silver-peptonate, which resembles the silver albuminate, physically, by its great sensibility to light, and chemically, in its behaviour towards free hydrochloric acid, common salt, and solution sodium hydrate.

For the purpose of experiment three mixtures were prepared:

1. Egg Albumen.....2 dr.
   Pure pepsin.....1½ gr.
   Water cont. 5 per cent. Hydrochloric Acid.....1½ oz.

2. Egg Albumen .....2 dr.
   Pure Pepsin.....1½ gr.
   Water cont. 5 per cent. Hydrochloric Acid .....1½oz.
   Nitrate Silver.....1-5 gr.

3. Egg Albumen.....2 dr.
   Pure Pepsin.....1½ gr.
   Water acidulated as above.....1½ oz.
   Nitrate of Silver.....4-5 gr.

These artificial mixtures for digestion were maintained at a temperature of from 105 deg. to 110 deg. F., for five hours. The digested mixtures were then examined. Solutions No. 1 and No. 2 were found completely digested, as no albumen could be detected by heat and nitric acid. The Silver combination was still intact and in solution, as shown by its behavior towards direct sunlight.

Solution No. 3 presented an entirely different aspect. The liquid was quite turbid and a deposit had formed. The filtrate when tested for albumen showed that the greater part had not been digested.

From these experiments it may be inferred that the digestive process is not interfered with or retarded when nitrate of silver is administered in the proportion of 1-5 grain to an ounce and a half of the fluid contents of the stomach, and by observing the relations here existing, larger doses may be safely administered with sufficient amounts of diluents.

A point which now presented itself for consideration was as to in what way and avenues the silver albuminate entered the circulation. Experiments were therefore instituted to ascertain whether the solutions of silver albuminate and silver peptonate, whether in acid or alkaline solution, were capable of diffusion through animal membranes. For this purpose the following solutions were prepared and subjected to dialysis.

No. 1. A mixture of albumen, acidulated water, and nitrate of silver.

No. 2. A similar mixture with the difference that an equivalent amount of peptone was substituted for the albumen.

No. 3. The mixture No. 1 made slightly alkaline with sodium hydrate.

No. 4. The mixture No. 2 made slightly alkaline with sodium hydrate.

Results as follows:

Diffusate No. 1 contained only H Cl. and silver albuminate was not discoverable by the sunlight test.

Diffusate No. 2 was identical with that of No. 1, showing that silver peptonate was incapable of diffusion through animal membranes.

The alkaline diffusates Nos. 3 and 4 gave no indications that a compound of silver had passed, and hence, the conclusion that alkaline solutions of silver albuminates and pectonates do not pass through animal membranes.

So far, my experiments have shown that either a silver albuminate or peptonate is incapable of absorption by the stomach or intestines.

What changes may be induced where these compounds are subjected to action of the pancreatic juice, I have reserved for future research. At the present time, the precise manner of entrance of nitrate of silver into the animal organism is to be considered still in abeyance.

THE MANUFACTURE OF MERCURIAL PREPARATIONS ON A LARGE SCALE.*

By AD. SOMMER.

The longest and most fatiguing of all pharmaceutical operations is the extinction of mercury in preparing blue ointment, blue mass, and mercury with chalk. Many of you have, undoubtedly, sought for and discovered methods, which, differing slightly from the orthodox pharmacopœial regulations, serve the purpose of economizing time. I, like the rest of you, have rubbed, and kneaded, and worked over these preparations, till the sweat would flow from my brow, and strong language from my mouth, and numerous are the experiments I made in order to lessen the labor. I do not intend to tire you by a description of the various methods I tried, but I will merely mention one which was confided to me while yet an apprentice in my fatherland, by one of those over-worked and illy-paid members of our profession, who in my native land bear the euphonious title of "Herr Provisor," and are called here briefly, "clerk." Upon my promise never to reveal his name, for the petrified Apothecary-laws of Germany do not sanction any deviation from the rules laid down by the Imperial Pharmaceutical Commission, he showed me how, by shaking mercury with certain liquids, such as oil of turpentine, or the resinous tinctures (Tr. Tolu, Tr. Benzoin), it could be brought to a state of fine division, in which condition it is easily mixed with semi-fluid fat. After this revelation mercurial ointment had no longer any terror for me, and whilst I was engaged in the retail business, I prepared, in this way, all the mercurial ointment that I sold. However, whilst this method may answer the requirements of the retail pharmacist, who is the supreme judge of the quality of his preparations, on account of the addition of foreign substances (the oil of turpentine or the tincture) to the ointment, the method is unsuitable to the manufacturer who makes large quantities of mercurial ointment for the trade. When, therefore, being requested to make this ointment by the hundredweight, I was obliged to look for a different method, I searched all the pharmaceutical literature which was at my disposal for practical, working formulas, but did not succeed in finding any which satisfied me. I then made a number of experiments, and was thereby led to adopt the following method and apparatus:

Mercurial Ointment.

Upon a solid board, which accurately fits into the frame of a sifting machine having a horizontal motion, are fastened, by means of wires and wooden cross pieces, two ordinary, iron mercury flasks. Into each flask are poured 25 lbs. of mercury, and $2\frac{1}{8}$ lbs. of any liquid fixed oil, prefer-

* Read before the Alumni Association of the California College of Pharmacy.

ably Union Salad Oil. The plugs are then tightly screwed into the openings of the flasks, and the whole apparatus is laid into the aforesaid frame. The frame, which is attached to an eccentric crank, is then set in motion by connecting the latter by means of a belt and pulleys with the shafting of a steam motor, and allowed to be shaken for about eight hours. At the end of this time the mercury is in so fine a state of division that a magnifying glass with a power of 10 diameters will show no globules of mercury. In the meantime 46 lbs. of beef suet are melted, and, after liquefaction, allowed to cool to about 50 degrees Centigrade. The contents of the two flasks are then emptied into a capacious pan, and about one-fifth of the liquid fat added. This mixture is then vigorously stirred, till it has become semi-solid, when another portion of the liquid fat, which, of course by very little warmth, must be kept as near as possible to 50 deg. C., is added to it. These additions and subsequent incorporations of liquid fat are continued until all of it has been added, observing only this special precaution: never to make any new additions before the previous one with the mercurial mixture has cooled down to a semi-solid state. The resulting mixture is generally tolerably uniform, but sometimes it happens that a small portion of fat hardens on the sides of the pan, before it can be incorporated into the mercurial mixture, thereby forming small lumps, which, on account of their yellow color, give to the finished preparation a mottled appearance. In order to overcome this objection, and to insure complete homogeneity, it was found advisable to pass the ointment, while still warm, through an ordinary iron paint-mill, under the lower muller of which is placed a trough made of tinned sheet iron. This trough is provided with a spout on one side, and a steel spring on the left hand side of the spout, which spring serves the purpose of scraping the lower muller, when, during the operation of grinding, the muller turns in the direction from right to left.

After the hopper has been filled with the semi-solid ointment, the mill is set in motion, whereupon the ointment flows down the spout in the form of a glossy, dark-gray band, and may be allowed to run at once into the receptacle that is destined to hold it. Should the temperature of the workroom be so low that the ointment congeals within the hopper, the latter should be warmed occasionally by means of a small gas or alcohol lamp.

When it is desirable to produce an ointment that is less crumbly than the one obtained by the previous formula, and that will possess a tenacity for which an article sent out by a Philadelphia manufacturer is highly valued by some dealers, the object can be attained by adding to the fat from 6 to 10 per cent. of rosin. The formula altered accordingly, for 100 lbs. of mercurial ointment, will be:

Mercury	50 lbs.
Union Salad Oil	4 "
Rosin	4 "
Fresh Beef tallow	42½ "

Shake the mercury with the oil until the former is finely divided, and add to this compound the mixture of rosin and fat previously melted and cooled to about 50 deg. C. Finally, pass the whole while still warm through a paint mill.

Blue Mass.

The extinction of mercury in Massa Hydrargyri is, perhaps, even more difficult than in Ung. Hydrarg., if you follow the directions of the U. S. Pharmacopœia; but by adopting a plan similar to the one just presented, the labor of preparing this article is reduced to a minimum. As in the preparation of mercurial ointment, so in that of blue mass, a liquid is required to divide the mercury. But the problem of finding one which would be unobjectionable for internal use, and at the same time envelop the particles of mercury as did the oil in the former preparation, and prevent their coalescence, necessitated many experiments. Remembering that ammoniacal glycyrrhizin, when dissolved in water, and strongly shaken, gives a soap-like froth, I assumed that it might also possess the enveloping properties of soap, and therefore dissolved a little of it in a mixture of alcohol and glycerin, and added to it a considerable quantity of mercury. After shaking the mixture for some time, the result was as I anticipated: the mercury was finely divided, and did not coalesce upon standing. Substituting then powdered licorice root for the ammoniacal glycyrrhizin, and a mixture of glycerin, alcohol and water for the liquid previously used, I obtained the same result. Furthermore, I found that a liquid composed of glycerin and water alone cannot be employed in this case on account of a thick froth, which forms on shaking, soon fills the vessel, and, acting like a cushion, retards the motion of the liquids. From these experiments I deduced the following formula and method for preparing the compound in question, the quantities given being sufficient for one flask:

Mercury	25 lbs.
Glycerin	2 lbs. 5½ oz.
Water, Alcohol } each	9½ fl. oz.
Powdered Licorice Root	3 oz.

These ingredients are all placed in an iron mercury flask, which is shaken precisely in the same manner, and by the same machine described above under Mercurial Ointment. After eight hours of shaking, the mercury is found to be finely divided. The contents of the flask are then poured into a large dish, and the honey added with energetic agitation. When this mixture has become perfectly homogeneous, the proper proportions of powdered rose leaves, marshmallow, and licorice root (all previously sifted), that are requisite for 75 lbs. of blue mass, are incorporated. Finally, that the mass may be made perfectly homogeneous, it is divided into lumps weighing about 3 lbs., which are kneaded on a table by means of a lever consisting of a long wooden pole, which at one end is fastened by a swivel-

joint to one side of the table, while the free end is manipulated by the operator. In place of the expensive rose leaves, which in this preparation serve apparently no therapeutic purpose, a mixture of powdered marshmallow and licorice root, perfumed with the oil of rose, may be substituted with profit, and is, perhaps, excusable.

Mercury with Chalk.

If it were possible that any pharmaceutical preparation could be even more tedious and aggravating than mercurial ointment and blue mass, it would certainly be Hydrargyrum cum Creta.

It matters not by what pharmacopœia you operate, you will, unless endowed with more than average human endurance, relinquish the work in disgust. The formula of the U. S. Pharmacopœia of 1880, which has been embellished with several extravagant modern improvements, has proven in my hands even worse than its predecessors. Where an inanimate machine is made to perform the labor of triturating, the official formula may be practicable. But the expense involved in constructing a complicated triturating machine, has induced several manufacturers to adopt more inexpensive methods.

Succussion, which serves so well to extinguish the mercury in the two foregoing preparations, is said to be equally serviceable in this case; but for various reasons, I have given the preference to a method lately devised by Mr. John Calvert, of San Francisco, whereby the extinction of the mercury as well as a complete mixture is effected by putting all the ingredients with some iron balls into a barrel and rotating the latter.

The apparatus I have constructed, and found very suitable for this purpose, consists in a rather flat barrel built of strong oak wood, whose diameter is 20 inches, and whose height (the distance from top to bottom) is 10 inches. The interior walls are planed perfectly smooth. Through the center of head and bottom is bored a one and a half inch hole, over which (on the outside of the barrel) are fastened, concentrically, two strong cast iron flanges, also having a one and a half inch hole through their centers. By this arrangement the barrel can be readily placed on a one and a half inch shaft, which is connected by pulley, belt, etc., with a steam motor. Two set-screws in each of the flanges serve to fasten the barrel to the shaft. In order to give access to the interior a piece of about four inches square is cut out of the top and fastened to the longer half of a T hinge, the shorter half of which is fastened to the solid portion of the head, while the other half, which overlaps the door by about two inches, passes over a staple, also driven into the solid portion of the head. By merely passing a tightly fitting plug of wood through the staple, after the door has been closed, the latter is effectually locked in the simplest manner.

When it is desired to make the mixture of mercury and chalk, a quantity of the ingredients necessary to make 25 lbs. of the finished product is placed in the barrel. At the same time three iron balls, each weighing about 5 lbs.,

are also put into the barrel, the door closed and locked, the barrel placed on a shaft, and the latter caused to rotate slowly by connecting it with the steam-motor. After the barrel has revolved around its axis for about ten hours, it is taken off the shaft, the door opened, and the contents removed. The mercury will then be found to be entirely extinguished, and completely mixed with the other ingredients.

When this preparation is made according to the process just outlined, there appears to be no necessity for the employment of milk-sugar in conjunction with chalk. The addition of sugar of milk was professedly only made by the U. S. Pharmacopœia in order to facilitate the extinction of the mercury, which purpose it does fulfil to a slight extent by the grinding action it exerts on account of the roughness of its particles upon the mercury. But when the extinction of the mercury can be so readily and completely effected without the sugar of milk by a machine, the manufacturer is apparently perfectly justified in returning to the original formula, sanctioned by all foreign pharmacopœias, as well as by those of the United States that precede the 1880 edition, and make this preparation, as its name indicates, from mercury and chalk only.

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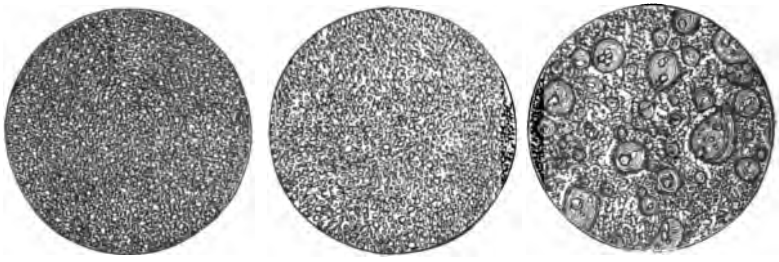

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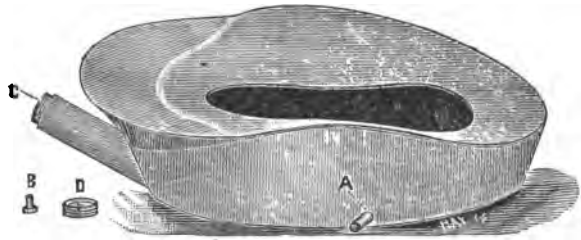

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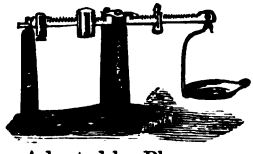

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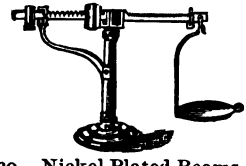

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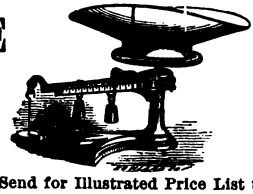

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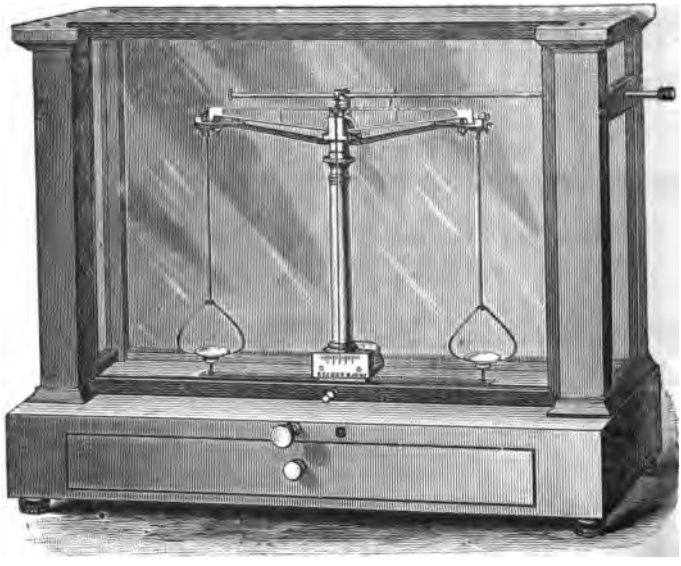

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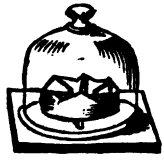

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